The OIL WEEKLY

10¢ A COPY

Exclusively Devoted To The Production and Transportation of Oil and Gas

Engineering News Statistics

February 14, 1930 Volume 56. No. 9

DESIGN

Hughes Rock Bits and Cones are designed for safety, economy and speed in operation. Ample clearance allows a free flow of the fluid around bit head and permits the continuous cutting action of the cones.

Few parts insures ease of assembly and great strength.

Continuous and ample oil lubrication of bushings makes for long life of cones.

Cutting teeth of cones are so spaced that they do not track —making possible a greater speed in making hole.

HUGHES TOOL CO.
Main Office and Plant
HOUSTON, TEXAS

use
HUGHES ROCK BITS & CONES
for Superior Performance

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

THE *Economy* of MASS PRODUCTION

...*in the* MAKING *of* AXELSON INTERCHANGEABLE LINERS

Straight-line production — well-devised "follow-thru" of boring, reaming and finishing processes, result in economical manufacture of Axelson Pump Liners; also absolute interchangeability. Every Axelson Liner of a given size is a perfect counterpart. Liners of a certain size purchased years hence will be identical to today's production. This same exactitude prevails in all Axelson manufacturing processes.

Axelson Manufacturing Co., Ltd.
P. O. Box 337, Los Angeles

Tulsa, St. Louis
New York City, 30 Church St.
Mid-Continent and Eastern Distributors—
Frick-Reid Supply Corporation

AXELSON *Liner* **PUMPS**

The OIL WEEKLY. Issued weekly by the Gulf Publishing Co., 3301 Buffalo Drive, Houston, Texas. Subscription price $1.00 per year; 10 cents per copy. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

fittings

The same quality of castings, the same accurate machining, the same careful workmanship that we put into Gaso Pumps we also put into Gaso FITTINGS. As a result, they have a special appeal for pipe line officials who build with the future in mind.

In addition to a comprehensive line of standard fittings—including heater heads, Beckwith swing check valves, liner expanders, river clamps, pipe line strainers, extra heavy flanges and ground joint flange unions—our foundry and pattern shop enable us to figure on special requirements.

Our engineering department is, as always, at your command.

GASO PUMP & BURNER MFG. CO. .. *Tulsa, Oklahoma*

FORT WORTH, TEXAS
NEW YORK CITY

GASO GRAY IRON TEE

GASO GRAY IRON ELL

GASO PIPE LINE STRAINER

GASO BECKWITH SWING CHECK VALVE

GASO PUMPS
for every oil industry need

EVERYWHERE! the Trend is Toward

ALLIS-CHALMERS TEXROPE DRIVES

THE PERFECT TRANSMISSION — ALLIS CHALMERS TEXROPE DRIVE — FOR EVERY PURPOSE ··

IN every industry, men are turning to Texrope as the drive that requires practically no maintenance . . . that assures continuous operation . . . that is unaffected by dirt or water. Today over 70,000 of these drives are in satisfactory service. In 1929 Texrope sales were nearly double the volume of 1928.

Where smooth starting and lack of vibration are essential to better work, Texrope has won instant approval. Particularly is this true in machine shops, textile mills, printing houses, woodworking plants and oil industry.

In plants where cleanliness is essential Texrope offers an outstanding advantage. You can turn a hose on Texrope without harming it or affecting its efficiency. Texrope requires no lubrication . . . consequently there is no oil or grease to guard against.

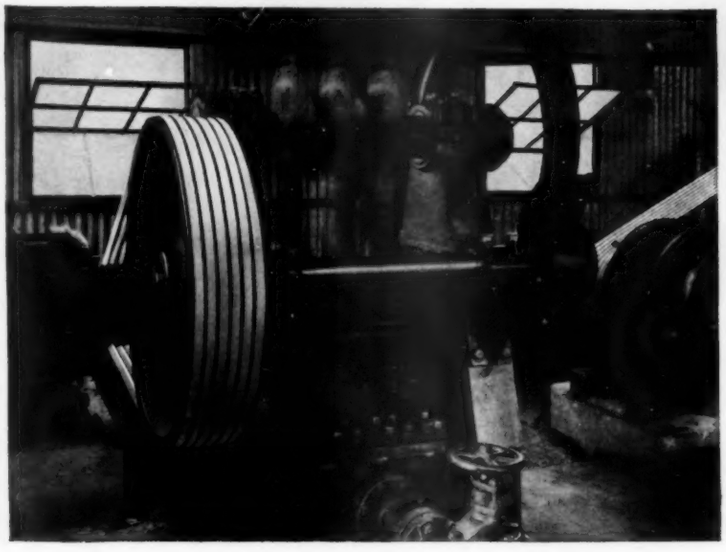
You, too, can cut costs and improve production with Texrope Drives. Try one where you've been having the most trouble. Texrope will sell itself by its superb performance.

Note These Advantages Offered by Texrope

Short centers. Always silent. Slipless. Unaffected by moisture or dirt. Vibrationless. Smooth starting, acceleration and running. Shock absorbing. Continuous operation. 98.9% efficient. Texrope belts and sheaves are carried in stock at points from which prompt shipment can be made to any part of the country. Write for a copy of bulletin 1228-K. It shows Texrope Drives operating in many industries.

ALLIS-CHALMERS MANUFACTURING CO., (*Texrope Division*)
MILWAUKEE *Specialists in Power Machinery Since 1846* WISCONSIN

In the oil fields Texrope Drives have enjoyed tremendous success. They are used on drilling rigs, pumps and a variety of operations. Climatic conditions do not affect Texropes.



Nor does sand, mud or water decrease their efficiency. The illustration shows an Allis-Chalmers 50 h. p. motor and Texrope Drive operating a plunger pump for the Boline Pipe Line Co., Logan County, Oklahoma.

BLUNTING THE REAPER'S SCYTHE

Time, that destroyer of property, finds the going hard in his effort to mow down IDECO Galvanized Structural Steel Derricks.

Many of the leading oil companies, foreseeing the economies and advantages in the all structural steel program have standardized on IDECO Derricks and Rig equipment.

Smaller operators who may be looking forward to the time when they may advantageously dispose of their holdings, will find their property more saleable if their wells are IDECO equipt.

THE INTERNATIONAL DERRICK & EQUIPMENT CO., Columbus, Ohio — Los Angeles, Cal.

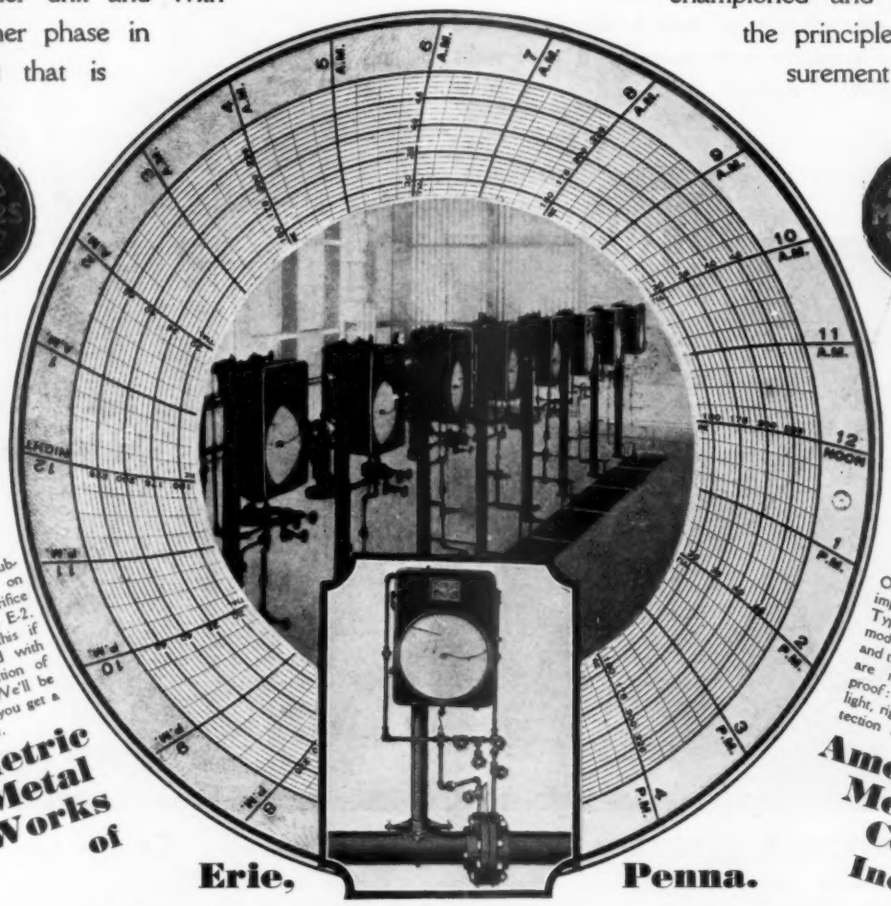
Plants: Columbus, Delaware, Ohio; Houston, Beaumont, Texas; Torrance, California. *Sales Offices:* Columbus, Ohio; New York City, N. Y.; Detroit, Michigan; Tulsa, Oklahoma; Ft. Worth, Houston, Texas; Shreveport, Louisiana; Wichita, Kansas; Denver, Colorado; Los Angeles, California; Maracaibo, Venezuela. *Warehouses and Yards:* Columbus, Ohio; Tulsa, Seminole, Tonkawa, Maud, Sasakwa, Allen, Oklahoma City, Oklahoma; Wichita Heights, Kansas; Bakersfield, Torrance, California; Houston, Big Spring, Odessa, Pyote, Borger, Mexia, Luling, Grand Saline, Wichita Falls, Orange, Seguin, Texas; Shreveport, Lake Charles, Oil City, Louisiana; El Dorado, Smackover, Arkansas.

Export Representation—74 Trinity Place, New York City; Columbus, Ohio; Houston, Texas; Los Angeles, California. 709

Measuring Performance Champion

Differential Mechanism Chart Pen Arms Clock Float Pressure Tube Case Orifice Disc

—every part essential to measurement—is a product of Metric *energy in research which has been matured by tests* that tax its ability to exist in measurement service of all characters. Not only to exist but also to function perfectly. Not only to function without fault but to coordinate smoothly with every other unit and with every other phase in the cycle that is necessary to complete accuracy. In themselves and in their relations, one to another, Metric parts make the measurement of gas a matter of mechanical precision. Reliability in precision and in accuracy is the main reason for the popularity of the Westcott Meter today, just as when it first championed and pioneered the principle of measurement by orifice.



The most recently published Metric data on measurement by orifice Meters is in Bulletin E-2. You should have this if you are concerned with operation or selection of orifice meters. We'll be glad to see that you get a copy—just write.

Metric Metal Works of Erie, Penna.

One of the more recent improvements is the T-Type case shown in this modern installation. This and the new B-Type cases are moisture and dust-proof: made of aluminum, light, rigid, locked for protection against tampering.

American Meter Co. Inc.

Sales Service: Westcott & Greis, Inc., Dallas Tulsa Los Angeles

METRIC orifice METERS

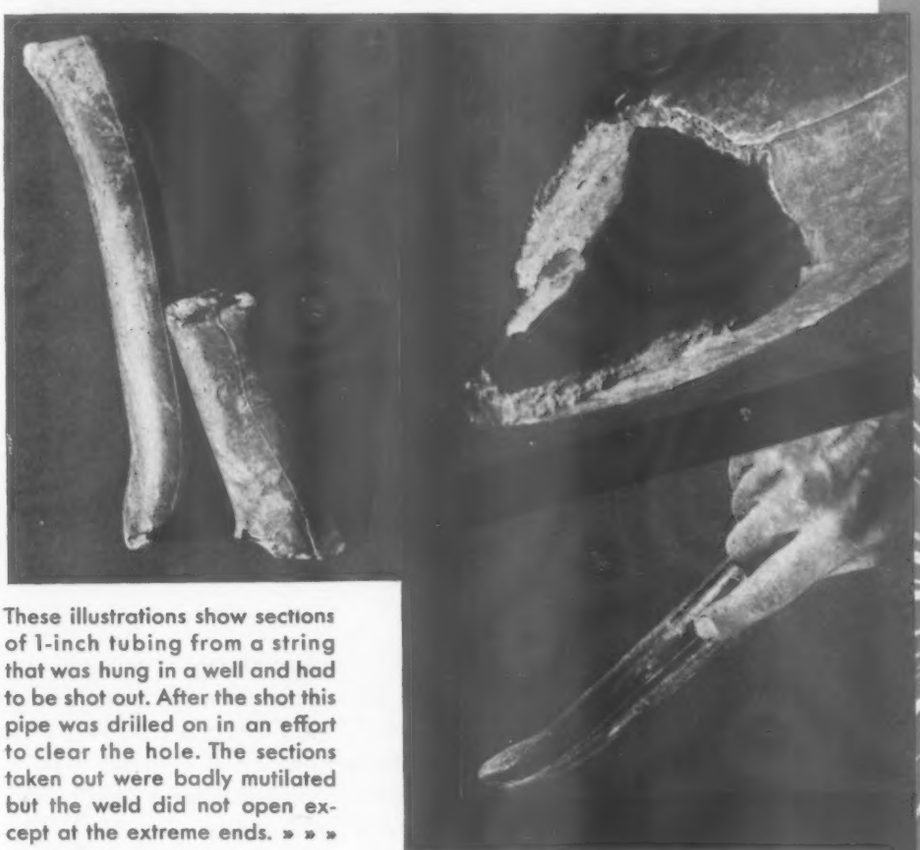
DYNAMITED!

but the weld did not open

ANOTHER PROOF THAT

YOUNGSTOWN

PIPE IS GOOD PIPE



These illustrations show sections of 1-inch tubing from a string that was hung in a well and had to be shot out. After the shot this pipe was drilled on in an effort to clear the hole. The sections taken out were badly mutilated but the weld did not open except at the extreme ends. » » »

"If Continental Sells It . . . . There Is No Better"

THE CONTINENTAL SUPPLY COMPANY
General Offices: ST. LOUIS

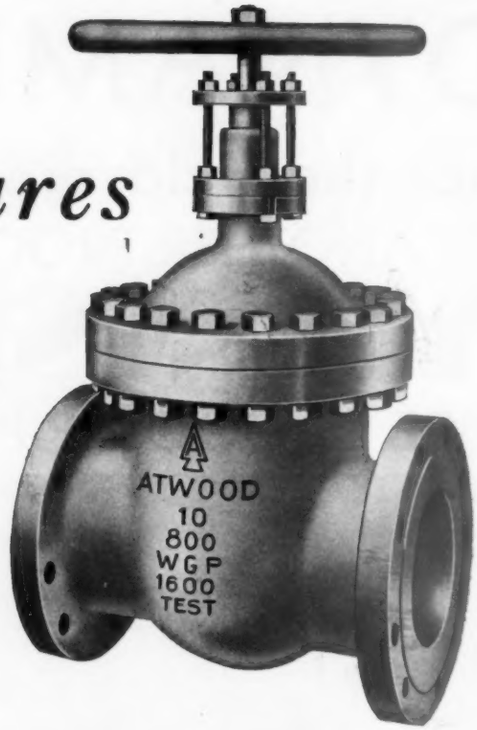
THE CONTINENTAL SUPPLY CO., LTD.
224 Traders Building, Calgary, Alberta, Canada

Export Offices: CONTINENTAL EMSCO COMPANY, INC. 74 Trinity Place New York
London Offices: 316-17 Dashwood House, Old Broad St., E. C. 2

CONTINENTAL

for High Pressures

ATWOOD Valves



FOUNDERS' experience of more than a century is cast into every ATWOOD valve body, so that when you specify an ATWOOD, you are certain to obtain the toughest, most enduring valve for the particular service for which it is intended. Maintaining our own iron, steel and brass foundries, pattern and machine shops, ATWOOD quality and design, from drawing to final pressure test, is absolutely under our own control. That's why you may depend upon ATWOOD valves for the higher pressures and more severe services.

For the most advanced type valve for every Oil, Gas and Steam Line condition, specify ATWOOD — designed and built to guarantee dependability, minimize maintenance expense and increase efficiency and the safety factor. Or should you have some unusual valve problem on your hands, ATWOOD Service—upon your request—is ready to help you at any time.

PITTSBURGH VALVE, FOUNDRY & CONSTRUCTION CO.
PITTSBURGH ~ PENNA.

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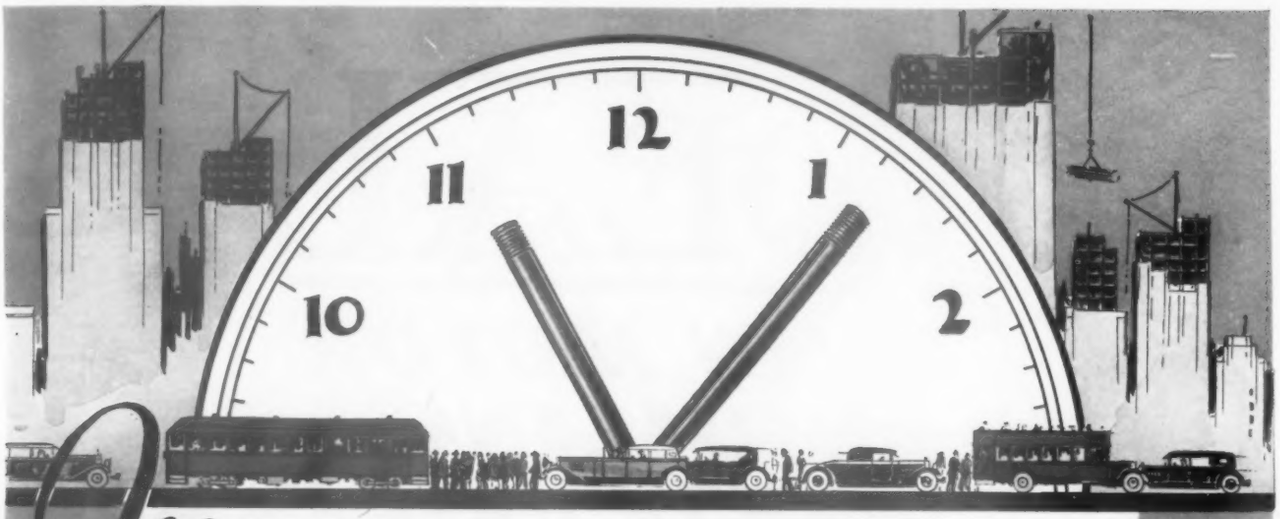
VALVES · WELDED PIPING · FITTINGS



Minutes LOST *mean* DOLLARS LOST!

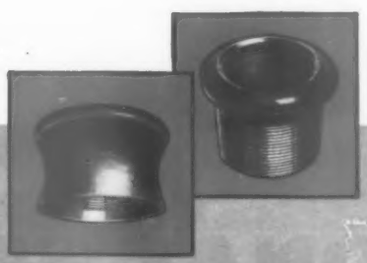
Nowadays when new pipe arrives at the job with battered ends and burred threads causing rethreading and unproductive labor, WHO IS TO BLAME?

Of course the threads *were* in perfect condition when they left the pipe mill but the pipe was *not* Colona Protected.

Colona Pipe Thread Protectors are now known and immediately available to all pipe manufacturers. They are patented—the only protectors that give 100 percent protection to the pipe ends, threads and couplings.

The simplest, most certain way of eliminating new pipe thread trouble is to SPECIFY COLONA PROTECTED PIPE in your order requisitions.

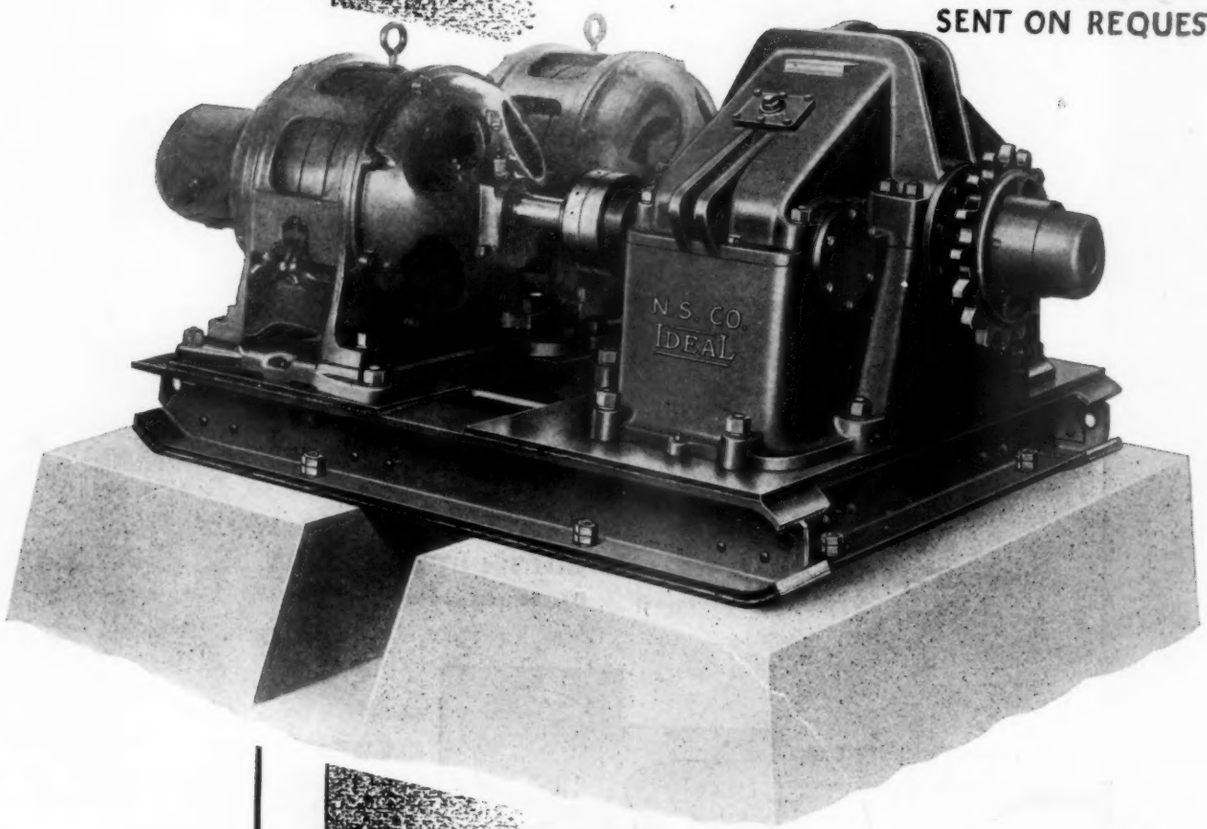
PITTSBURGH SCREW & BOLT CORPORATION
Colona Division · Pittsburgh, Pa.



COLONA PIPE THREAD PROTECTORS

IDEAL
TWIN MOTOR DRILLING
REDUCTION GEAR

DESCRIPTIVE BULLETIN
No. 80
SENT ON REQUEST



THE
NATIONAL SUPPLY
COMPANIES

"For every joint on every line"

Why tolerate pipe line leaks and money losses—when Victaulic Couplings insure 100% leak-proof lines—at low cost

?

Mail the Coupon for Victaulic Bulletin

For all sizes of steel, wrought iron, cast iron and spiral weld pipe—any pressure. Mail the coupon for detailed information.

VICTAULIC COMPANY OF AMERICA
26 Broadway New York

"For every joint on every line"

FLEXIBLE LEAK-PROOF

VICTAULIC

REG. U. S. PAT. OFF.

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Chicago, Illinois

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CASE HARDENING SERVICE CO.
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THE McJUNKIN SUPPLY CO.
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FOR CRUDE OIL GAS WATER SEWAGE COMPRESSED AIR ETC.

For uses, installations, specifications and prices, fill in and mail this coupon.

VICTAULIC COMPANY OF AMERICA
26 Broadway New York

Please send me Victaulic Bulletin No. 8

Name.....

Address.....

HASCROME
. . . . A patented self-hardening alloy combining hardness and toughness.
. . . . An excellent building-up rod for badly worn parts preparatory to hard facing with Haynes Stellite.
. . . . May be applied to steel or cast iron. The deposit has a tensile strength of 40,000 and a compressive strength of 177,000 pounds per square inch. It can be forged but not machined.
. . . . Its hardness varies with the method of application and the rate of cooling. Oxwelded deposits have a hardness of 240 to 500 Brinell depending upon the amount of excess acetylene in the flame and the rate of cooling. (Slow cooling makes it harder than quenching does.) Arc welded deposits have a hardness of 240 to 400 Brinell depending on the rate of cooling.
. . . . Hascrome is available in bundles of 50 lbs. at $.50 per lb. for 1/4" diameter rods or $.55 per lb. for 3/16" diameter rods.
HAYNES STELLITE COMPANY
Unit of Union Carbide UCC and Carbon Corporation
DISTRICT SALES OFFICES
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New York—30 East 42nd Street
Tulsa—Exchange National Bank Bldg.
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HASCROME
HASTELLOY
HAYSTELLITE
HAYNES STELLITE
Fair Prices
Quality Products
Dependable Supply
Engineering Service
HASCROME

BOROD

TRADE MARK

The TUNGSTEN-CARBIDE

In Welding Rod Form

"A New *Stoody* Product"

BOROD is not designed to replace any of the previously perfected products of the Stoody Company, but to fill a definite need, that of providing the welder with a rod that will deposit a smooth, continuous overlay of Tungsten - carbide alloy with the least effort.

With Borod—there is no mixing, no carbon arc, no complicated methods — just apply it as you would any other welding rod, either with the Electric Arc or the Acetylene Torch—then watch it make hole — straight hole — keeping the bit out to gauge all the time.

Ease of Application

Use Borod on the next bit—start now—while Tungsten-carbides are making history—breaking records—doing things that were never before heard of in drilling.

BOROD is a member of that world-famous family of Hard-faces: Stoodite, Stoody Rod, Borium and Borod.

A Card Will Bring Full Particulars

STOODY COMPANY

Manufacturers of **Welding Rod Alloy Steels** Equipment

WHITTIER :: CALIFORNIA

Distributors in Principal Cities

WRIGHT

HOISTS-TROLLEYS-CRANES

21 points of superiority

No.1-Load Chain

—made of special analysis drawn steel.

—electrically welded, die formed, specially heat treated, proof tested.

—combines unusually high ultimate strength and yield point with great ductility.

—held to exceedingly close limits of analysis, strength and conformation by [illegible] and [illegible]

CHAIN HOISTS—TROLLEYS—TRAVELING CRANES—JIB CRANES—LOW HEAD ROOM TROLLEY HOISTS—TWIN HOOK HOISTS—HAND WINCHES, Etc.

You can secure WRIGHT Equipment from your Jobber

WRITE FOR NEW CATALOG

WRIGHT MANUFACTURING COMPANY
BRIDGEPORT, CONNECTICUT.

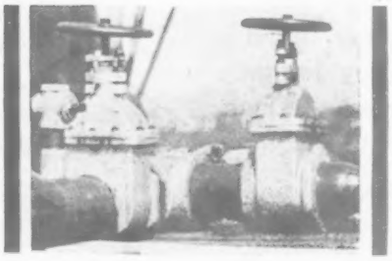
ACCO
An Associate Company of American Chain Company, Inc.
In Business for Your Safety

EVERY VALVE BEARING THE.... JARECKI MARK.. IS TESTED INDIVIDUALLY UNDER PRESSURE

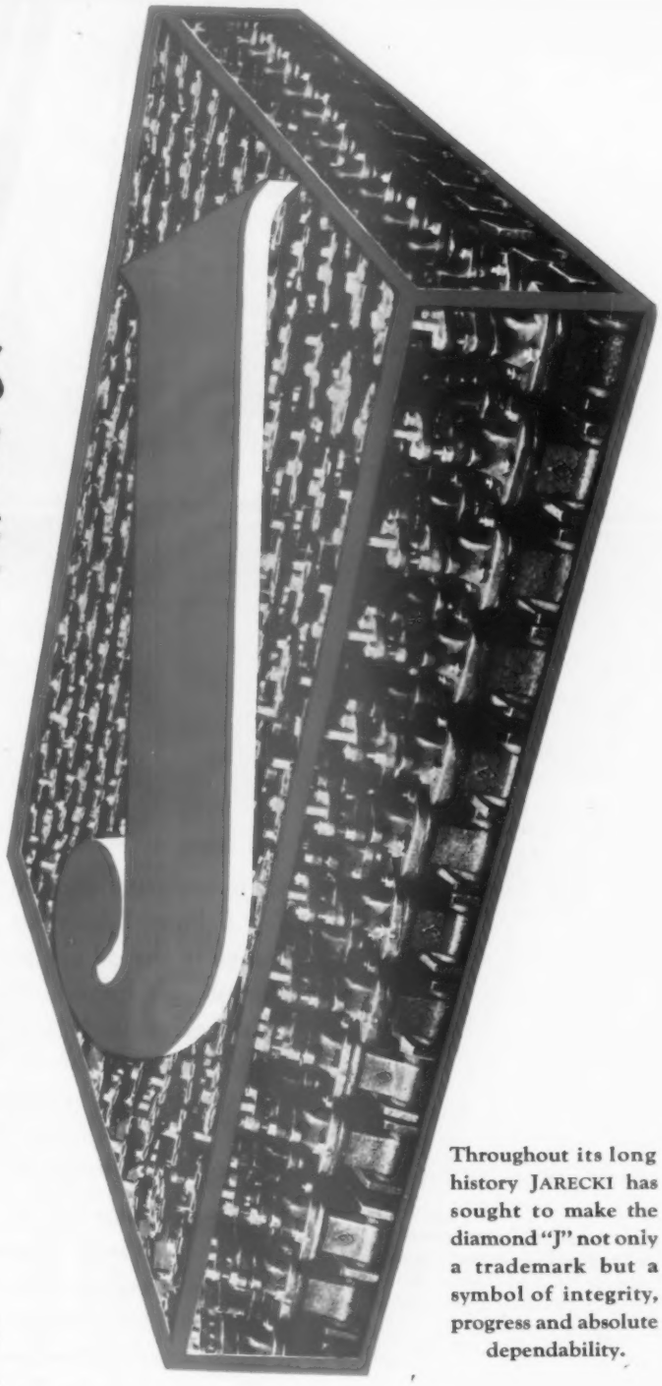
All reputable products are inspected before shipment, but very few receive such *thorough* tests as JARECKI Valves.

In addition to periodic and exacting inspections during the manufacturing and assembling processes, each valve is tested individually under pressure before shipment. . . . . No wonder customers so often remark on the uniformly perfect condition of JARECKI Valves.

JARECKI Valves are well proportioned and soundly designed, with an unusually generous margin of safety over working pressure ratings. . . . . .To standardize on them is to assure yourself the most dependable valve service it is possible to buy.



JARECKI Valves in service.

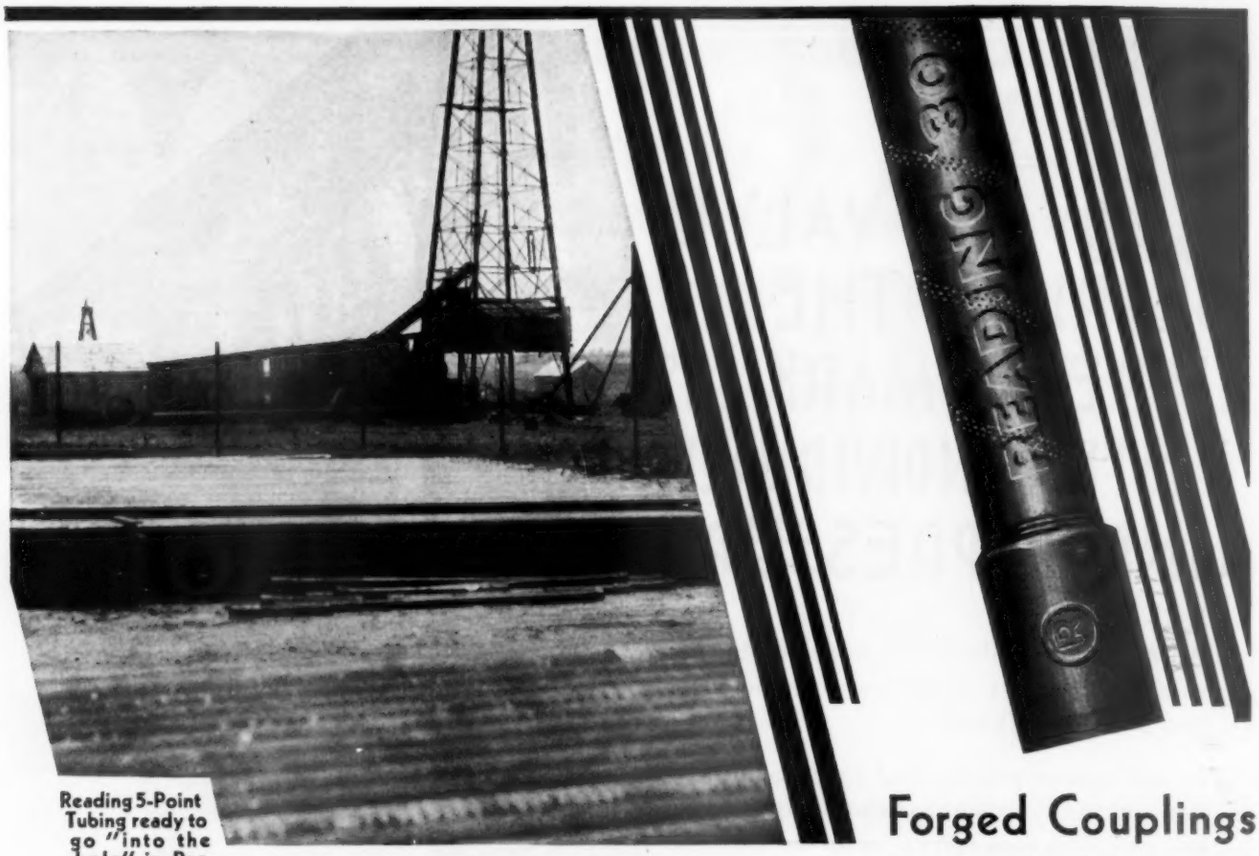


Throughout its long history JARECKI has sought to make the diamond "J" not only a trademark but a symbol of integrity, progress and absolute dependability.

Branch Stores at all important places in the Oil Country

Jarecki
MANUFACTURING COMPANY
Home Office and Factory—Erie, Pa., U. S. A.

General Office—St. Louis, Mo. *District Offices*—Pittsburgh, Pa.; El Dorado, Kan.; Tulsa, Okla.; Newark, Ohio; Eastland and Dallas, Texas; Lawrenceville, Ill.



Reading 5-Point Tubing ready to go "into the hole" in Peabody District, Kansas.

Forged Couplings

Just Another Advantage of Reading 5-Point Tubing!

It's easy to understand why Reading Galvanized 5-Point Tubing has gained such wide acceptance in the oil country. All couplings, for example, are forged—not rolled—and the threads are galvanized, too! And when you remember that Reading 5-Point Tubing inherently resists corrosion—that it will not crystallize—and that it holds galvanizing several times more thickly than other ferrous tubing materials—you have a combination that's hard to beat!

All Reading 5-Point Tubing, Casing, and Line Pipe are made of the original, Genuine Puddled Wrought Iron, tested in the toughest fields by generations of use. You'll protect yourself from substitutes by looking for the Reading name and indented spiral mark on every length of Reading 5-Point Pipe.

As an added improvement, all Reading Galvanized Couplings for Reading 5-Point Tubing are now furnished with galvanized threads.

* * *

Reading pipe distributed by:
Frick-Reid Supply Corp.
Bradford Supply Co.
Republic Supply Co.
Superior Tube Co.
Our own stocks at Houston, Texas

READING IRON COMPANY
Reading, Pennsylvania

Atlanta . Baltimore . Cleveland . New York . Philadelphia . Boston
Cincinnati . St. Louis . Chicago . New Orleans . Buffalo . Houston . Tulsa
Seattle . San Francisco . Detroit . Pittsburgh . Los Angeles . Kansas City

5 POINT PIPE READING GENUINE PUDDLED WROUGHT IRON

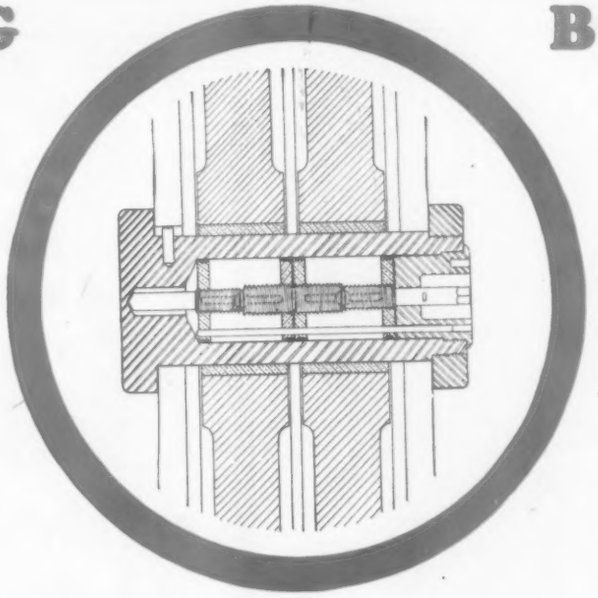
GENUINE PUDDLED WROUGHT IRON
READING PIPE
DIAMETERS RANGING FROM ⅛ TO 20 INCHES

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Wrought Iron

DREADNAUGHT

TUBING BLOCKS

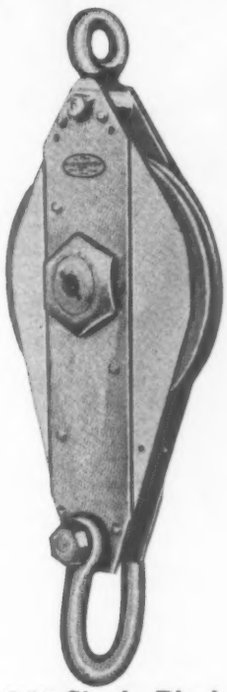
Cutaway view of Automatic Center Pin



With Patented Automatic Grease Pin

30″ Double Tubing Block

36″ Double
Showing guards attached



36″ Single Block
Without Guards

These Blocks are perfectly balanced. No Tilting.

Genuine Dreadnaught Quality Construction throughout.

Sheaves of Dreadnaught Semi-Steel.

A.P.I. Standard Rope Grooves, machined smooth.

Heavy Bronze Bearings Positive Lubrication

WRITE FOR LITERATURE

BUY FROM YOUR DEALER; ANY FRICK-REID STORE; OR DIRECT

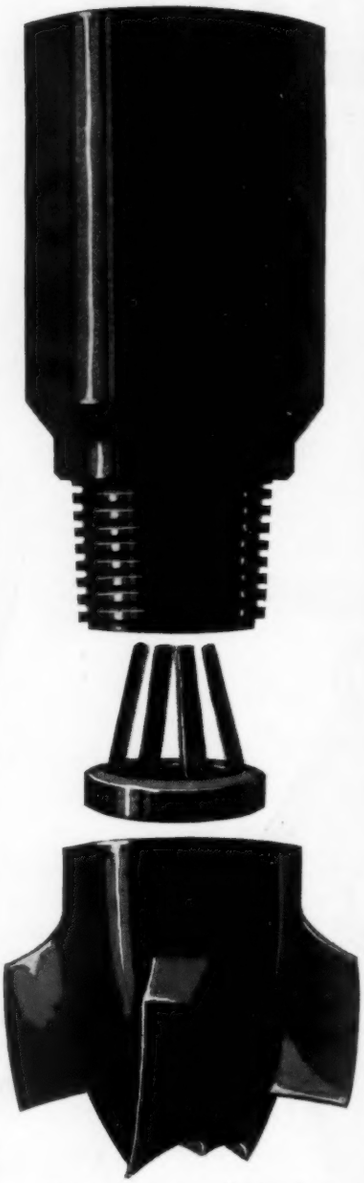
BEAUMONT IRON WORKS COMPANY

Manufacturers of

DREADNAUGHT EQUIPMENT

WE FAVOR THE STANDARDIZATION PROGRAM OF THE AMERICAN PETROLEUM INSTITUTE

Beaumont, Texas, U. S. A.



Elliott research, development and experiments in materials go on forever. When, if ever, there is a better material to use for core drills, we will know it—and we will use it.

SPECIAL ANALYSIS Steel makes the Elliott a better core drill

The steel used in the manufacture of Elliott cutterheads is a product of our own formula—

Ever since we produced the first Elliott Core Drill we have experimented with and tested every type of material available for a tool of this kind. None has been ignored. Costs have had nothing to do with the acceptance or rejection of any. Our only purpose has been "coring results."

Of all the materials available, Elliott Steel has proved by far the best. It has proved its superiority in every kind of test conceivable by our engineers, metallurgists and field men—continuously over a period of years. And this superiority is a precisely correct combination of digging ability, wearability and high percentage of core recovering and *retaining* ability under actual operating conditions.

Elliott steel has much to do with the superior performance of Elliott Core Drills. It is clearly reflected in the long, informative cores and the low cost per foot of core recovered which Elliott Core Drills are noted for. A careful comparison of Elliott performance will prove this beyond question.

ELLIOTT CORE DRILLING CO.
840 Subway Terminal Building
LOS ANGELES, CALIFORNIA

Export Office:
150 Broadway, New York
Distributed exclusively in the United States east of the Rocky Mountains, by
REED ROLLER BIT COMPANY

ELLIOTT Core Drills

SKILLED SUPERVISION GUARANTEES THE QUALITY OF GULF PRODUCTS

COASTAL AND PARAFFINE CRUDES
GASOLINE — LUBRICATING OILS
NAPHTHA — GAS — OILS
WAX — PETROLEUM COKE
CYLINDER—ENGINE—CORDAGE

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New York Harbor (Bayonne, N. J.)
Jacksonville, Fla.
Port Tampa, Fla.
Mobile (Magazine Point, Ala.)
Philadelphia (Girard Point, Pa.)
Charleston, S. C.
Savannah, Ga.
New Orleans (Gretna, La.)
Port Arthur, Texas
Galveston, Texas

SLING-SHOT AGAINST MACHINE-GUN

What Chance Has He?

This photograph shows the extent of termite damage after a few months. The same thing will happen to your timber if you don't guard against it.

The weapons of modern warfare against the crude missiles of the jungle. Machine-gun against sling-shot. What chance has the savage?

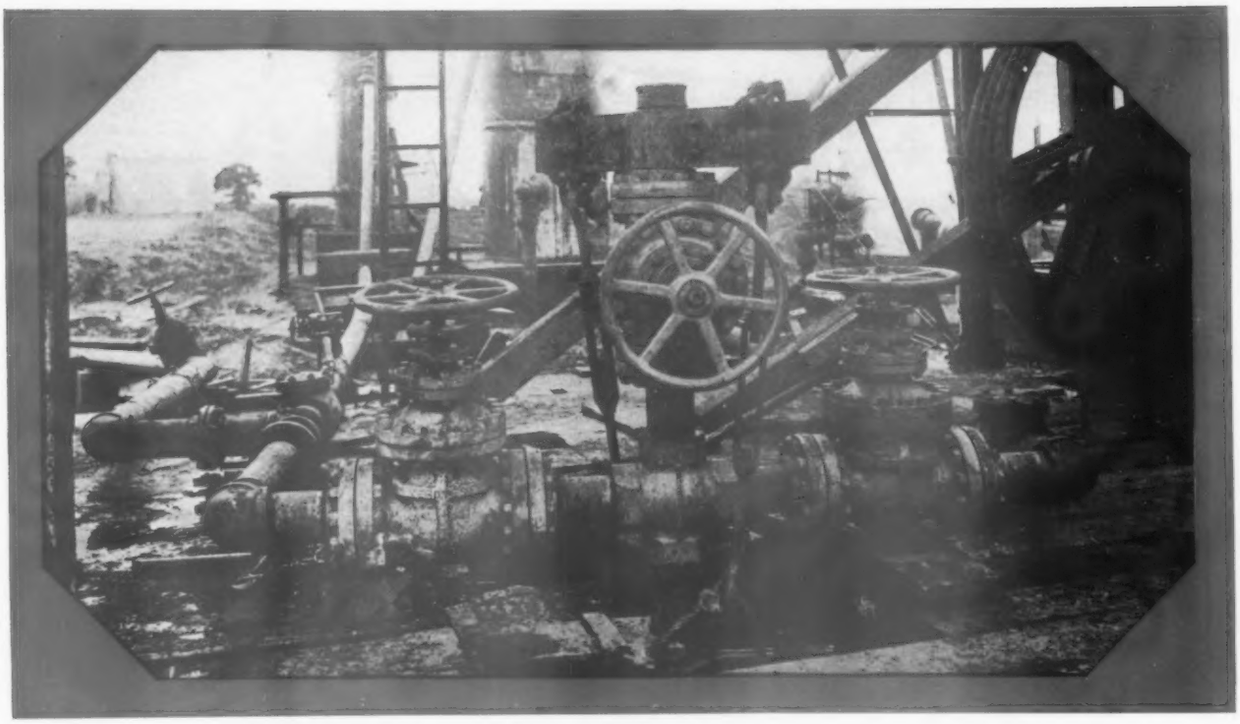
More chance than your timber when you throw it untreated to the teredo . . . the deadly shipworm that honeycombs timber and piling in salt-water locations . . . destroying them in a few short months. There is one positive way to defeat the teredo. Protect all your timber with the "Black Beauty" creosoting process—a process that guards it against both teredo infection and the inroads of termites and fungi in other locations.

Send your specifications to our corps of experienced engineers. We will prepare your material and keep it for you until you need it. Then it will be sent to you without any waits or delays. Give your timber a chance—Use "Black Beauty" products.

"BLACK BEAUTY" *Products*

TEXAS CREOSOTING COMPANY

ORANGE, TEXAS HOUSTON, TEXAS



THE LARGEST LIGHT OIL WELL IN THE WORLD COMPLETELY

Kerotest Equipped

Exclusive California Representative

OIL WELL SUPPLY COMPANY

KEROTEST

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KEROTEST Products handled this job perfectly.

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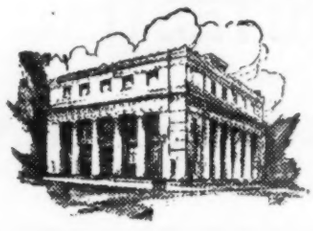

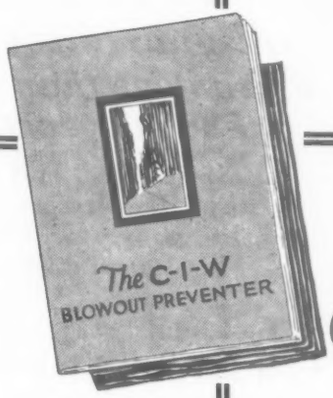

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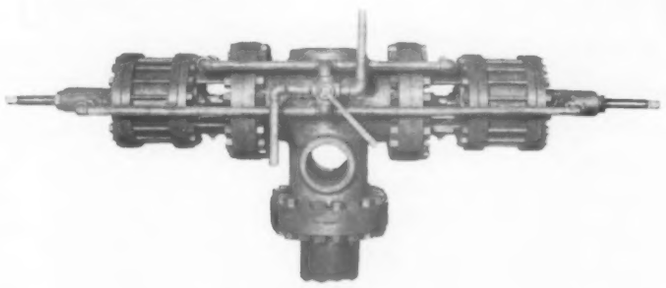

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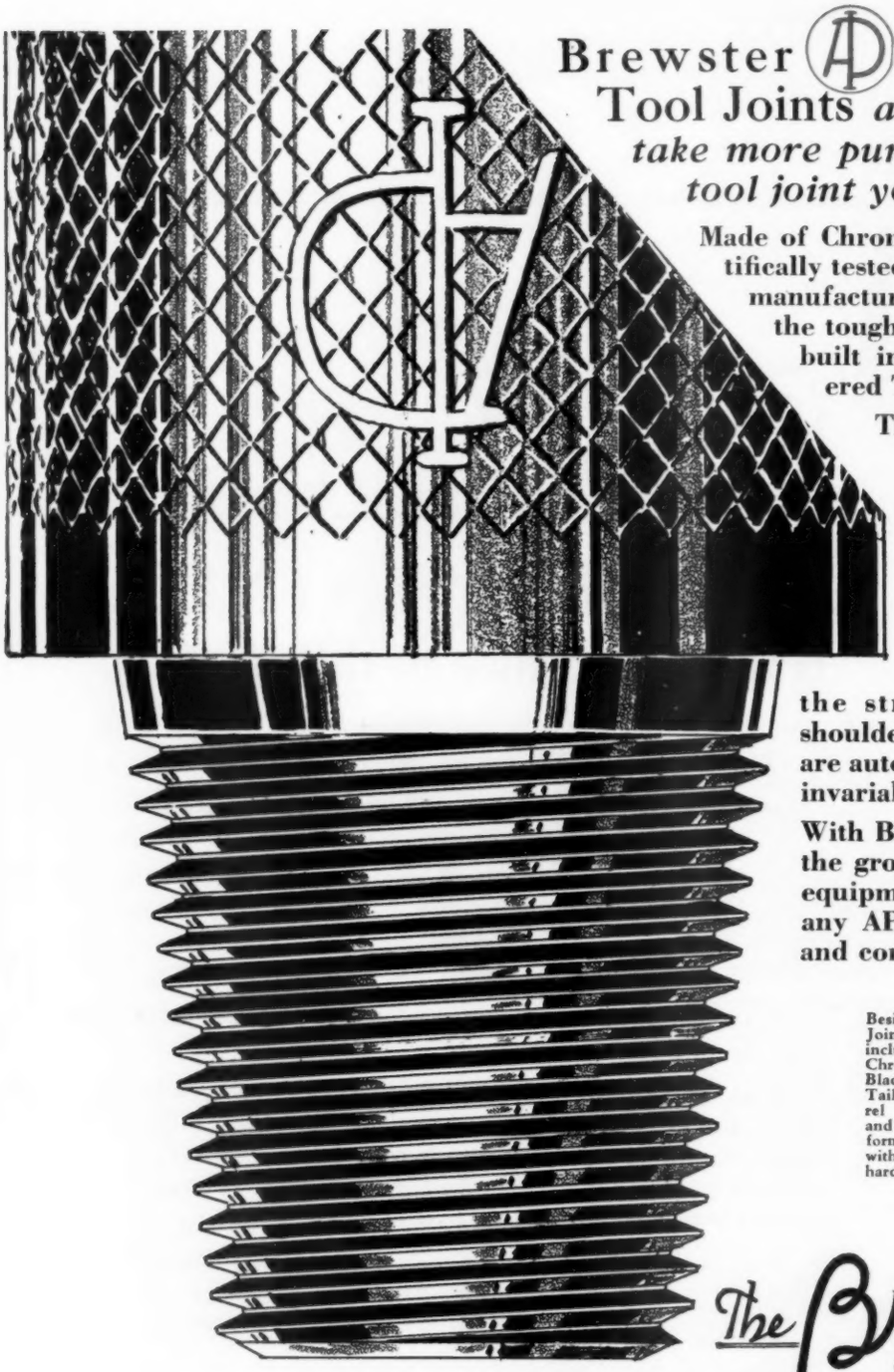

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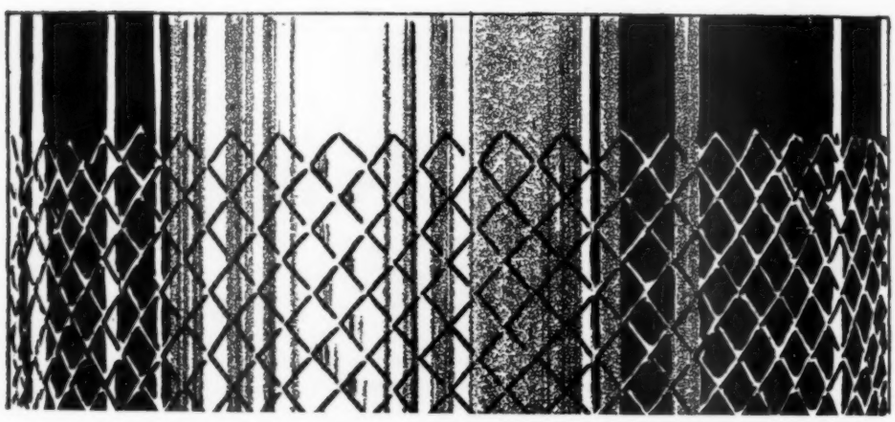

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SPENCER W. ROBINSON, EDITOR

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by

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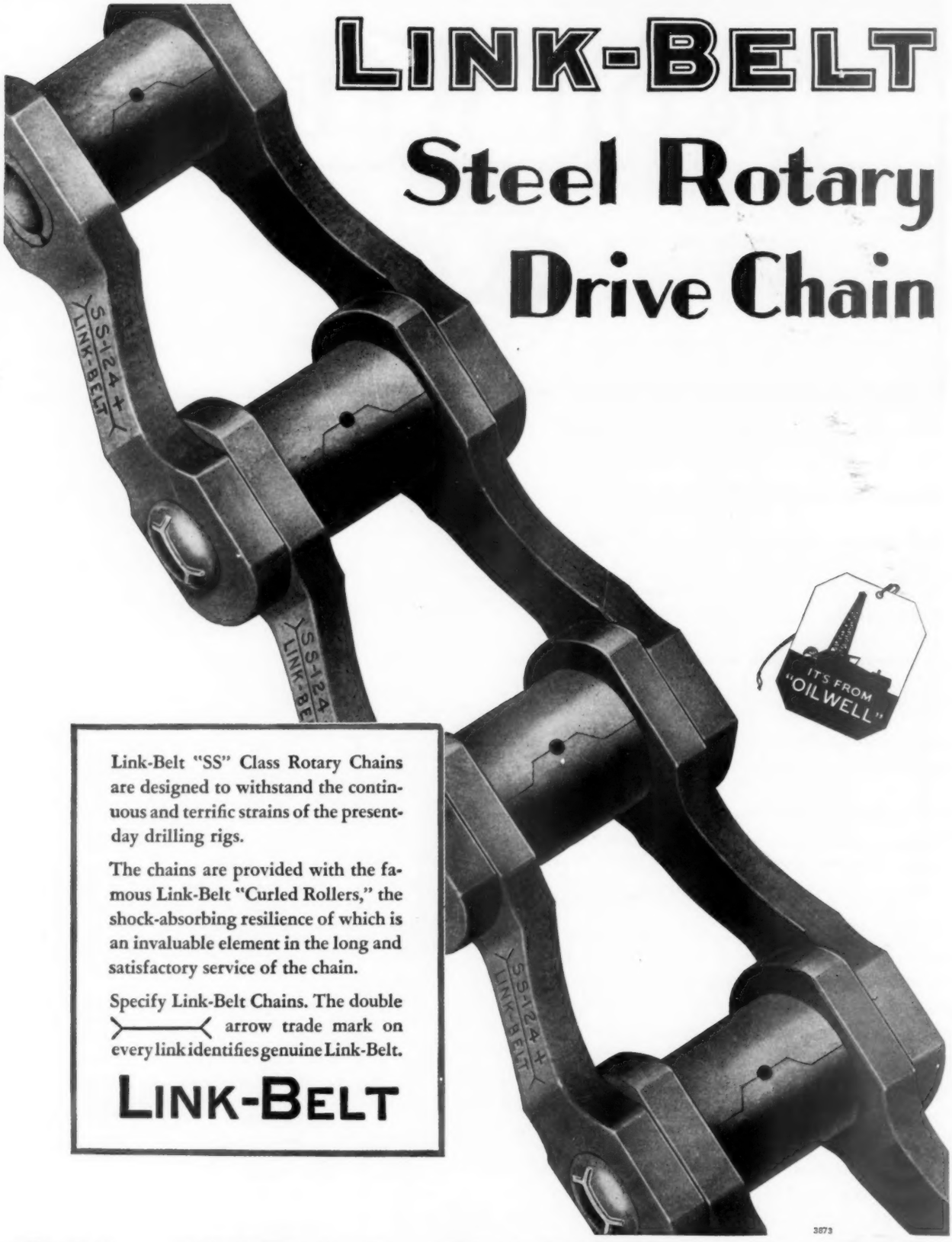

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WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

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Volume 56, No. 9 *February 14, 1930*

The OIL WEEKLY

A GULF PUBLISHING COMPANY PUBLICATION

California Operators Plan Cut to 600,000 Barrels

By BRAD MILLS
Staff Representative

LOS ANGELES.—Faced with 50-cent crude oil and 10-cent gasoline, leading California operators are hastily whipping together a curtailment plan which will bring production down to about 600,000 barrels and hold it there for at least the remainder of 1930. Executives of major oil companies, addressing meetings held this week in Los Angeles, predicted a wide-open break in crude and refined markets unless operators stop quibbling, place their shoulders to the wheel and hold the output to a more sensible level.

Every flush field in the state is affected and a six-day, wide-open test will be made to establish positive potentials. Exact allowables for the various fields have not been determined, but by using the American Petroleum Institute's estimates to arrive at actual economic needs, the state's total will not exceed 609,000 barrels under the present plan. The gross figure was found and it will be necessary to make production from the individual fields meet this total for the remainder of 1930. The total output is subject to slight change, but a higher figure is not anticipated.

A committee of 15 was appointed to work out a plan for placing the entire state under curtailment measures immediately. In some instances one member will look after a certain area and report to the general committee, of which he is a member. Although all members are to serve more or less in a general capacity, these specific designations are expected to speed up the work of the committee as a whole. The members of the committee follow:

Herbert R. Macmillan, Macmillan Petroleum Corporation.

W. E. Dunlap, Richfield Oil Company.

A. T. Jergins, Jergins Trust.

J. U. Stair, Shell Oil Company.

J. H. Jenkins, Associated Oil Company.

W. H. Berg, Standard Oil Company.

J. A. Brown, General Petroleum Corporation.

Paul N. Boggs, Union Oil Company.

J. A. Bermingham, The Texas Company.

R. A. Sperry, General Petroleum Corporation.

A. H. Bell, Continental Oil Company.

William C. McDuffie, Pacific Western Oil Company.

S. B. Mosher, Signal Oil and Gas Company.

H. P. Grimm, Umpire for Santa Fe Springs, Ellwood and Ventura.

Neal H. Anderson, umpire for the Long Beach field. Paul N. Boggs is general chairman of the committee.

Prompted by a desire to straighten out what is commonly referred to as a "mess," a two-day meeting was held by the committee and other operators. Failure of operators to meet requirements in the fields where curtailment agreements are in effect, unethical practices of producers who are making for weaker gasoline prices and the various subterfuges practiced to avoid curtailment were discussed. By lifting up the lid of the industry in California and viewing the very heart of the situation, executives pointed out to the operators the necessity of more stringent curtailment measures. Talk of 25-cent crude was heard and five-cent gasoline was openly discussed, but it is not commonly believed that prices so low would prevail if the least semblance of order is maintained. The situation is admittedly grave, however, and several operators who have been lukewarm in their attitude announced that they are willing to reduce their output to lower levels.

Production has been a little harder to hold down since January 1, while the first week in February saw conditions growing rapidly worse. The output has been fully as high as consumption and both oil and gasoline stocks have been far too high. A few companies have gasoline tanks slopping over and feel that only a smaller production of crude oil will eliminate the evil of high refinery runs.

Considerable crude has been diverted from regular channels and thrown on the market, only to be reflected in a less stable gasoline market. Production at Santa Fe Springs has been well above the allowable figure and there has been a decided tendency to work schemes which temporarily increased the output. All phases of the market have shown a weaker tone, although the posted prices remained about the same for refined products. Leading executives have challenged the motives of operators who do not profess to believe in conservation and announced that the output must be brought under control or the industry will be plunged into a state of chaos. Major operators who have held out for certain provisions are now ready to make concessions in order that the output may be lowered.

Elwood, Ventura and Long Beach operators have already met to discuss means for a more rigid curtailment program and plans are being completed for actual inauguration of the scheme. The Elwood field was opened up February 7 to ascertain its potential production on a six-day test. The Ventura Avenue field will be opened up not later than February 10 for a determination of its potential.

It is largely upon the action of Santa Fe Springs operators that the success of the statewide program depends. It has been unofficially announced that if producers in this field insist upon producing more oil than the market will stand prices will soon be reduced to meet actual existing conditions. Conservation leaders see no hope if this most critical field fails to fall in line and stay there.

A meeting of the general committee will be held early in the week to receive a report of the progress in the

(Continued on page 78)

Tariff Advocates Pleased *With* Progress Made

By WARREN BAKER
Staff Representative

TULSA.—Independent oil men's fight for a tariff on crude oil was materially enhanced during the past week as they continued to overcome obstacles with the vigor and determination that has characterized their work in Washington. Whether they win their fight or not, they have obtained real results since their arrival in the national capitol one week ago Monday. The fight then considered in the hopeless class is now one of hopefulness, and while they may not obtain a tariff on oil in this session of congress, they have secured a sufficient bloc to assure a bitter fight, and eventually, if they do not let up, a tariff on crude oil is likely.

Time is one of the principal factors against the oil operators, which resulted in them working doubly hard during their visit. As one official of the government stated, the oil lobbyists were the most active committee in Washington and had succeeded in sweeping congress off its feet by its activities. Every senator has been interviewed and now knows the purpose of their visit.

But only a few days remain before the present tariff bill will come to a showdown in the senate. At this time the tariff bill is in the hands of the senate finance committee and is due for introduction on the floor of the senate at once. It has already passed the house. Any amendment to include oil will most likely have to be made upon the floor of the senate, rather than through the finance committee. It is practically assured that an amendment asking for a tariff on oil will be made, as several prominent senators wish to carry the battle. Already a special bill has been introduced into the house by Congressman W. W. Hastings of Oklahoma, which makes special provisions for a tariff on crude oil.

It was hoped that a sufficient bloc could be pledged to force a majority of the senate to accept the amendment in the hope of strengthening the general bill which is admittedly in a precarious situation. The oil tariff bloc has been increasing rapidly until about 25 senators have made commitments and about half that number are favorably inclined but have not committed themselves. It is possible that if the tariff on crude oil is introduced on the floor as an amendment to the present bill, which now seems assured, especially since Senators Elmer Thomas and W. B. Pine, of Oklahoma, have such a bill written and laying on their desks, that it might be withdrawn to permit the passing of the present tariff bill should its placing on the bill indicate that the entire bill might be killed, provided that an agreement is made whereby some form of legislation will be enacted to limit importation of crude oil and refined products to set a per cent of the daily domestic crude oil production.

Additional Hearings Are Secured

Additional hearings were secured by the tariff advocates, headed by Wirt Franklin, president of the Independent Petroleum Association of America, last week. Foremost among these were those before the old guard of the Republican party and the ways and means committee of the house.

The hearing before the ways and means committee, last Saturday, was especially favorable for the independent oil men. When Chairman Hawley of the committee inquired if the conference could agree on an oil tariff would they be assured of the support of the minority leaders, Representative John Garner of Texas, minority floor leader of the house was on the floor at once and made a ringing statement, saying: "I will vote to ratify the conference report on the entire Republican tariff bill now in the senate, if a tariff on oil is written into it." He continued in part as follows:

"The oil industry is frankly the under dog. It has been left out of the tariff bill that the house has recommended and sent to the senate. This bill neither construed oil as a part of agriculture nor even as an industry. Have you laid before the people who originated this conservation business, the situation of oil?"

Wirt Franklin replied that they had advised the Federal Conservation Board, Secretary Ray Lyman Wilbur, and even President Hoover with little results. Garner then replied: "It is my opinion

(Continued on page 33)

Group of independent Mid-Continent oil producers as they arrived in Washington. This picture taken at Union Station: Left to right—J. Edward Jones, of New York; Ross D. Pine, Okmulgee; Tom Cranfill, Dallas; J. W. Olvey, El Dorado, Arkansas; Wirt Franklin, Ardmore; Senator Elmer Thomas of Oklahoma; Wade H. James, Tulsa; J. I. Cromwell, Oklahoma City; H. B. Fell, Ardmore; Congressman W. W. Hastings of Oklahoma; Joe Danciger, Fort Worth; Wilburn Cartwright and E. B. Howard

Statement Presented Congress *To* Support Tariff Plea

By WIRT FRANKLIN

President Independent Petroleum Association of America

IN asking for a tariff on oil we are asking no more than the other industries and producers have asked. We are asking no new or untried experiment. Every item we use in our refinery is protected. The tools and appliances that we use are protected. We pay the most uniformly high wages of any American industry; our employes are contented, although their work is hard and living conditions often unsettled, owing to much of our activities being in the open, yet they are loyal to the American ideal and to their work.

We carry the greatest burden of taxation of any industry (in some cases paying the entire cost of the current state expense), and do not complain. We were loyal to our government during the war; our commodities increased less in price than any other in proportion to their value. In deflation the industry has borne its burden and has not tried to pass it on. The gasoline that was worth $1.00 in 1913 now costs $1.18, while at the same time building materials of $1.00 valuation in 1913 cost $1.73 now, house furnishings $1.61, farm products $1.42. The average of all commodities is $1.51.

We are a part of one of the greatest of American industries. This industry has been classed as probably the most characteristically American of all our great industries.

We come to you knowing your interest in the general welfare of our government, and ask you to consider our cause as the facts justify, laying aside any impressions that you may have received, and listen to our cause and consider it in that great American spirit of fair play.

On September 27, 1929, the Hon. Charles Curtis, now Vice-President of the United States, in an address at Tulsa, Oklahoma, the oil capitol of the world, said: "In the last two revenue bills I proposed a duty on oil. You, in Oklahoma, I see have requested the limitation of oil production. I took a market report and found that last year (1927) we imported 77,000,000 barrels of oil into this country. I suggest that we shut out those 77,000,000 barrels, and we would not have to shut down production here."

Now we find that instead of the 77,000,000 barrels imports of 1927 being shut out, said imports were increased in 1928 as follows: Crude oil, 79,583,000 barrels; refined products in excess of 12,000,000 barrels, or a total import of crude and refined in excess of 91,500,000 barrels, while in the year 1929 the total imports of crude and refined oils exceeded 109,000,000 barrels, said figures being roughly as follows:

Gasoline, 9,000,000 barrels;
Fuel oil, 23,000,000 barrels;
Crude oil, 77,000,000 barrels.

WIRT FRANKLIN

The tariff question has ceased to be a partisan question for the democratic platform of 1928 contained language guaranteeing the protection of American industry by the imposition of a tariff almost, if not quite as forceful, as the platform of the Republican party. Therefore, we come before you not as partisans but as citizens of this great country, expecting to receive at your hands that fair consideration justified by the facts in the case.

Conservation

We have heard much during the past three or four years of the subject of conservation of petroleum resources. The producers of oil, large and small, have with ever increasing unanimity given their cooperation, at great sacrifice, to further this cause, hoping that there might result from this move a stabilization of the oil industry which would be beneficial alike to those engaged in the industry and the general public; but, nevertheless, we must confess that we have followed the movement with serious misgivings because of the fact that the whole movement has seemed to us to have been builded upon a false foundation of fact. The press of the country has been filled with predictions and forebodings announcing to the industry and the general public over a long period of time the early exhaustion of the petroleum reserves of the United States to the point of endangering national defense. Throughout the oil producing states we have been exhorted to curtail production in the name of patriotism, if you please, until the curtailment movement during recent months has successfully and fully brought about an admitted balance between supply and demand, even though during the same period imports of crude oil and refined products have increased almost in the exact ratio of the curtailment in domestic production, until it is apparent to the most casual observer that the conservation and curtailment movement alone, as heretofore applied, will not in itself accomplish the stabilization of the petroleum industry, or prevent the great waste, economic and actual, which its most ardent advocates have predicted. The logical continuation of this program unaccompanied by some measure to restrict importation of oil and refined products, will be the ultimate destruction of that vast army of American citizens engaged in the petroleum industry, with its accompaniment of distress to the hundreds of thousands of men employed in the oil fields, refineries and marketing agencies, and allied industries.

To show that this program of so-called conservation is builded upon a false foundation, it becomes necessary at this point to sum up the former estimates of future oil production in the United States, and later to call attention to the vast petroleum reserves which we actually possess:

1908—David T. Day estimated a minimum of 8,500,000,000 barrels; estimated a maximum of 15 to 22½ billion barrels. From 1908 to 1929, inclusive, United States has produced 10,441,447,000 barrels. All of Day's minimum, plus 23 per cent.

1914—Ralph Arnold estimated future production at 5,700,000,000 barrels. From 1914 to 1929, inclusive, United States produced 9,178,396,000 barrels. All of Arnold's estimate, plus over 61 per cent.

1915—U. S. Geological Survey estimated

future production at 7,600,000,000 barrels; 1915 to 1929, inclusive, United States has produced 8,912,633,000 barrels. All of that estimate, plus 17 per cent.

1918—White estimated future production at 6,700,000,000 barrels; 1918 to 1929, inclusive, United States produced 7,995,446,000 barrels. All of White's estimate, plus nearly 20 per cent.

1921—Certain petroleum geologists of A. A. P. G. estimated future production at 9,150,000,000 barrels; 1921 to 1929 inclusive, United States produced 6,818,222,000 barrels. Nearly 75 per cent in nine years.

1925—Committee of Eleven estimated future production from proven acreage on present methods—5,300,000,000 barrels; 1925 to 1929, inclusive, United States has produced from these properties and new pools 4,342,161,000, almost 82 per cent.

1929—In the year 1929 the United States, according to best estimates available at the present writing (January 27, 1930) produced 1,004,415,000 barrels, compared with 902,000,000 barrels in 1928.

1857 to 1929, inclusive, from the beginning to date, the United States has produced a total of 12,248,090,000 barrels. The production is now over a billion barrels per year with the production curve on the up-grade.

"In 1913, the United States produced 248,446,000 barrels. In 1929 Oklahoma, alone, produced over 250,000,000 barrels, or more oil than the entire United States produced in so recent a time as 1913. Oklahoma produces a billion barrels of oil each four years; it is capable of producing a billion barrels each year, if the demand called for such development. The same is true of Texas and California. It is highly probable that any one of the states of Oklahoma, Texas and California can produce as much oil as the entire United States has produced to date. The oil resources of these states loom larger with each passing year. They are getting the exploration. Other states would leap forward correspondingly if corresponding development were done within their borders."

No Overproduction

The production of the United States has been swinging upward from the discovery of oil up to the present time, a period of 72 years, and when we consider that the vast domain from the Canadian line to the Gulf of Mexico lying immediately east of the Rocky Mountains is a potential oil territory practically undeveloped and unexplored, it is apparent that the production curve will be on the upward trend for many years to come and that when said curve starts downward, if that day ever comes, we will produce from those known reserves of oil as much or more oil than had been produced prior to the day when said decline curve will start on its downward course.

What I have said above has been applicable to reserves of oil to be produced from oil wells. We now come to a consideration of the vast reserves contained in the oil shale deposits of the States of Colorado, Wyoming and Utah. These deposits have been accurately surveyed, their oil content measured, and suffice it to say that in one deposit in Colorado the experts of the government, and the Colorado Bureau of Mines are agreed that there are 80,000,000,000 barrels of recoverable oil. Should it ever become necessary to use the same we have in our coal deposits of the United States, being approximately 54 per cent of the coal deposits of the world, another great source of oil, so great that it is difficult for the human mind to comprehend. Oil and its derivatives, including gasoline, is being produced in two plants in Germany on a commercial basis and in competition with well oil by processing coal according to the Borgius hydrogenation process. Thus it appears that there is no danger whatever of the exhaustion of our petroleum reserves in the United States. This is the oil age. Let us use our oil reserves while they are yet valuable, while we need them and before some new form of power is discovered which will supercede it. Let us not shut in the production of oil which we now have, or stop a sane and orderly development of our great oil deposits and by so doing bring ruin and destruction to all of those business interests of the oil producing states which have come to be dependent upon, in a major degree, the oil industry in these states.

It appears to us that the only beneficiaries of such a policy would be the four or five companies now engaged in producing and importing foreign oil who naturally would like to have the American market exclusively. The United States consumes approximately 68 per cent of all the oil produced in the world, and is capable of supplying that demand at home with domestic production. In like manner this country is now producing approximately 68 per cent of the world's production of oil. There is no overproduction in the United States now and there never has been if imported oil and refined products are not taken into consideration.

Save Small Wells

From the standpoint of true conservation there could be no measure adopted of more efficiency than a tariff on oil and the refined products thereof. Mr. M. L. Requa, chairman of the Colorado Springs Conference, stated in his opening address at that conference that there are now in the United States 250,000 wells producing an average of one barrel per day each, and there are in addition to that at least 50,000 other wells whose production will average five barrels per day, the total production of these wells being approximately 500,000 barrels per day. These wells have been operated for the last three years at a loss, but nevertheless operated by their owners in the hope that some solution might soon be found and these wells again become profitable. Vast numbers of these small wells have, during this period, been abandoned. How much longer can the owners of these wells continue to operate them at a loss? Certainly not indefinitely. Still it must be admitted that these small wells are the backbone of the oil industry, its very life-blood. Their abandonment because they are unprofitable would be the most serious blow to conservation of oil in the United States which could be imagined. Once abandoned it would never be profitable to again drill wells to the same sand, and this vast amount of production would be lost forever. A tariff of $1.00 per barrel on crude oil, and a commensurate tariff on refined products will save these wells and 500,000 barrels of oil per day for the domestic consumers.

Costs of Imported Oil

In this connection it is now pertinent to call attention to the fact that the average cost of production of oil in Venezuela, the point of origin of a major portion of our imports, is 18 cents per barrel at the well. The average cost per barrel of this oil delivered to the deep water at Maracaibo is 40 cents per barrel, and the transportation charge from that point to Atlantic and Gulf Coast ports is 35 cents, making a total cost of 75 cents per barrel, while the pipe line transportation charge alone on oil produced in the great Mid-Continent field, which is supplying the bulk of the oil produced in the United States today, to these same centers of consumption and distribution will average about 76 cents per barrel. It can therefore readily be seen that domestic oil cannot compete with these imported oils.

It has heretofore been argued by opponents of a tariff on oil that the levying of a tariff would keep foreign oil out of the United States and thus take away from the laborers of the United States, employed in refineries and from American capital invested at home, the processing and refining of this foreign oil, that we should allow free importation of crude oil for this reason, that is a tariff should be levied it would cause the construction of refineries at the various sources of supply and thus result in a direct loss to American capital and labor; but this argument, if it ever had any weight, has ceased to be effective for the reason that refineries have been constructed off the coast of Venezuela, there being two such refineries there at this time, with a total daily refining capacity of 240,000 barrels, now operted at full capacity, with the result that whereas most of the imports previously were of crude oil, the past year the imcreased two and one-half times the volume of 1928, and cheap gasoline thus produced has brought further demoralization upon the petroleum industry, both producing and refining. What the future holds for us in this regard can well be imagined, unless the congress shall levy, without delay, a tariff upon refined products. We wish to make it clear at this point that we are not advocating the exclusion of crude oil where the same is imported for refining and re-export, and willingly agree that crude oil so imported in bond should be permitted to come in free of duty, as in the case of other commodities.

Another argument against a tariff on oil, which at first thought will seem to have some weight, is that the imposition

of a tariff would be detrimental to the interest of the consumers (buyers of gasoline), that the consumers so far outnumber the producers and refiners and those employed in the petroleum industry that their interests are paramount, and the duty should not be imposed. Now let us examine the figures and see if the consumer of gasoline and lubricating oils has received any benefits whatever from cheap imports. In February 1926, in 52 cities throughout the United States, the average price of gasoline at the filling station was 20 cents per gallon, the average price of fuel oil was $1.28 per barrel, while the average price of crude oil during February, 1926, in Oklahoma and Kansas of .36 gravity was $2.04. In February 1929 the average price of gasoline at the filling station in the same cities was 19.5 cents per gallon, the average price of fuel oil was 75 cents, while the price of crude oil in Kansas and Oklahoma of .36 gravity was $1.20. The same relative price schedules obtained throughout the years 1926 and 1929. Every consumer knows that he has paid approximately the same price for gasoline and engine oil during this period. The price of gasoline to the consumer has not fluctuated in proportion to the price of crude oil, but the bottom has fallen out of fuel oil, the price of which at times has been reduced in certain of the oil producing and refining centers to as low as 50 cents per barrel, thus bringing about a very wasteful utilization of this oil, which might better be conserved for higher uses than fuel. This cheap fuel oil coming into competition with coal has thrown the great coal industry out of joint, and no less than 50,000 American laborers employed in the mines and the transportation of coal out of employment. The beneficiaries of this cheap fuel oil have been the manufacturing industries of the country, principally of New England and the Atlantic seaboard, which industries, through their associations, have protested against a tariff on oil, but which industries themselves depend for their very existence, if due credence is given to their claims in hearings before the committees, upon a high protective tariff, and without which they could not exist. These industries are anxious to continue the present policy of free import of oil suitable for fuel, and as before stated, the consumer of gasoline does not receive the benefit therefrom, and the loss thus occasioned is passed on to the producer of crude by the fixing of a low price for crude oil.

Again the argument is made that as long as exports are more than imports there should be no tariff imposed upon oil. At the present rate of increase of imports these conditions will not long prevail, but nevertheless let us see if this argument is sound under the present state of affairs. We find that in 1928 the exports of oil from California were 41,000,000 barrels, while there were no imports to the Pacific Coast, that during the same year the exports from the United States to Canada, which can be considered as part of our legitimate market, were 22,200,000 barrels, or a total in the two items of exports of 63,200,000 barrels. The total exports from the United States in 1928 were 146,126,000 barrels. Deduct therefrom the exports from California and to Canada, and you have a total of 82,926,000 barrels exported from the Gulf and Atlantic ports, while at the same time there were imported into the country at Gulf and Atlantic ports 91,474,000 barrels, or a total of 8,548,000 barrels more imports than exports. We are answering this false argument only for the purpose of showing that even were it a good argument it is based upon a false reckoning, because practically every article on the tariff list is exported to a greater extent than it is imported. Take for example steel products. Exports in 1928 were in excess of $500,000,000 while imports were about $18,000,000, and still we have a high protective tariff on steel products, and the oil producers of the United States are compelled, under existing conditions, to pay an added price by reason of such protective tariff on all their oil well supplies.

We believe that the domestic market for crude and refined oil should be reserved for American producers and refiners. There is no argument which can be made against a tariff on oil that cannot be made with equal force against a tariff on anything else. Conversely it is true that every argument and every reason for the imposition of a tariff on any material or article on the tariff list applies with equal force and reason to a tariff on oil. We have been told that a tariff on oil cannot be obtained because it is a vital necessity to the entire population of the United States. Still we have a tariff on wheat, beef and many other articles of like importance, and what is more vitally necessary to the people than bread and meat?

We would call attention to the fact that the condition with which we are now confronted is not of a temporary nature, that exploration work is being carried on by the companies now importing oil into the United States almost throughout the entire length and breadth of South America, that the reserves of petroleum thus far discovered and already tested and partially developed are of such magnitude as to make it certain that the present situation will be continued for an indefinite number of years to come, that in fact the vast domain from the Carribean Sea to the Southermost tip of South America, on the east side of the Andes Mountains, contains reserves of petroleum sufficient to monopolize the entire market of the United States, so that if it is the purpose of those supporting the present so-called conservation plan, which apparently has for its purpose the reserving of the oil deposits of the United States for use after exhausting the supplies of foreign oil, the oil industry in the United States through this conservation and curtailment program is doomed to complete demoralization.

Tariff Advocates Pleased With Progress Made

(Continued from page 30)

that you should lose no time in getting to work bringing pressure upon the people who can influence this committee to recommend the reporting out of the committee of the Hastings tariff bill that is before it."

A meeting was held Thursday with Secretary Robert P. Lamont, of the Department of Commerce. It was the same afternoon that a meeting with the Old Guard of the senate, headed by Senator Jim Watson, senate floor leader, was held. Watson admitted that he would favor a tariff on oil. Wirt Franklin had lunch with President Hoover (his second visit) on Friday. The president invited him through Secretary of War Patrick Hurley, a former Tulsa resident and independent oil man, and who has been instrumental in securing several hearings for the oil men.

The oil state senators are getting together to see about how many votes they have secured and to select a leader. Senator Thomas of Oklahoma considers the fight his, as he has been an advocate for several years, and there are other prominent senators desirous of carrying the banner.

Additional Reserves Arrive

While most of the 225 oil men that accompanied the special train to Washington last week have returned home, the special having left Washington Saturday night, there remains a strong delegation in Washington to carry on the work and additional reserves are arriving.

Two Pullmans made up from Tulsa and Oklahoma City left these cities the latter part of last week. On board were C. J. Wrightsman, candidate for the senate from Oklahoma and a fighter for tariff, and several other prominent oil men.

J. Berry King, attorney-general of Oklahoma arrived last week and stated: "I come not representing we or they, but the state of Oklahoma, and am supported by other state officials. I speak for every citizen of Oklahoma and every consumer of oil, who could not come because the depressed conditions of oil business kept many at home." He closed his short statement by saying: "There can be no sensible argument made against a protective tariff. I say this as a lifelong democrat."

Robert Lee Bobbitt, attorney-general of Texas, also came during the week. From day to day additional oil men came into Washington to lend their support. Attorney-General Robert Winbourne of Colorado left for home, but not until he had done much constructive work. Winbourne found that on the present records of congress is a provision applying to all commodities that are taxed with a tariff which provides for the 'manufacturing, or milling in bond,' such as the oil tariff advocates are asking. So the fight over this portion of the oil tariff question seems settled. This would permit the 'refining in bond' of imported crude without a tariff, in the event it was exported as refined products.

Texas Committee Makes Progress In Curtailment Plans

By H. H. KING
Staff Representative

FORT WORTH, Texas. — Favorable progress was made within the past week towards an early curtailment of daily crude production in Texas by 100,000 barrels, or more, as a means of relieving the over-production of oil and to apply more rigid conservation measures. The general committee of operators working to bring about such a reduction in the state's output advanced nearer their goal when a reduction of 30,000 barrels in the daily yield of the Yates field was obtained, along with assurances from groups of operators in other fields that new production would be curbed. Action was deferred in dealing with other fields that are slated to contribute to the general production curtailment program for fear of running afoul of existing state laws governing such matters, and the committee is to present their proposed program of curtailment to the governor and other executives at Austin early this week.

An all day conference was held in Fort Worth February 6 by the general committee of 31 operators and representatives of the leading oil producing companies in the state. This committee was elected by operators during a mass meeting in Fort Worth January 31 after receiving the report of the Texas Division of the Mid-Continent Oil & Gas Association as to general conditions in the oil industry. J. D. Collett, Fort Worth producer, was elected chairman of the general committee, and R. R. Penn, president Penn Oil Company, Dallas, vice-president. Nearly all the members of the general committee attended the executive session February 6 to report on their respective districts. These consolidated reports then armed the committee with definite data as to what fields can be curbed should adequate support to the program be given by Governor Dan Moody and the legislature.

Pending Legislation

Considerable discussion took place during the conference of the general committee in regard t o an oil and gas conservation bill that is soon to be presented to the legislature that would empower the Texas Railroad Commission with legal authority to apply and enforce curtailment of drilling and production in disturbing fields. The gas conservation feature of the proposed bill is patterned after the California law, with some alterations to meet conditions in Texas. The Texas Railroad Commission is enforcing proration of oil in Yates, Winkler County and Howard-Glasscock County fields, and has received hearty cooperation from producers in these three areas, with opposition offered by only two producing units in Winkler County, where a temporary injunction was used against the commission by the protesting companies to get relief from the rules.

AUSTIN, Texas.—Authorized curtailment of production in the Yates field from 130,000 to 100,000 barrels daily effective February 10 was cancelled by the Texas Railroad Commission late Saturday after having a conference with the attorney general's staff.

The commission acted favorably upon the unanimous recommendation of the Yates field proration advisory committee upon receipt of the formal report, but rescinded the order before it went into effect in order to comply strictly to the rules that require the commission to hold a public hearing and to give 10 days notice of same.

A hearing has been set for February 21 at Austin, according to R. D. Parker, chief supervisor of the oil and gas division, and all interested operators will be invited to attend.

The next important step of the general committee is to go to Austin and obtain the support of the governor and the legislature in having the state's oil and gas bureau (Texas Railroad Commission) take an active part in the conservation program through the passing of cooperative legislation. The commission has taken an active interest in previous efforts of the Texas operators to curb excessive production and waste, and has cooperated to the extent of its legal powers, which are rather vague and limited under existing laws. It is hoped to get the legislature to validate the work of the commission in applying and enforcing proration, and also to amend the laws so that operators would have the right to meet and formulate conservation programs to be submitted to the commission for approval and enforcement. The results that the general committee and interested operators gain at Austin will probably decide whether the oil industry in Texas will be restored to a normal status by curtailment, or remain in its present unstable condition.

Yates Cut Again

Acting on recommendations of the Yates field proration advisory committee, the commission issued orders February 7 for the reduction of allowable production in the Yates field from 130,000 to 100,000 barrels daily effective 7 a. m. February 10. The Yates field advisory committee made its recommendations for a 30,000-barrel reduction in a formal report to the commission after holding a meeting in Fort Worth February 5, and prompt action was given the report by the authorities at Austin. W. A. Moncrief, Fort Worth operator, is chairman of the Yates field advisory committee. The cut in Yates field's production will be absorbed proportionately by all producers, while the four pipe line companies serving the field will likewise have their runs reduced on the same basis. Humble Oil & Refining Company is the major crude purchaser in the Yates field, and was offered relief on crude takings by absorbing a greater percentage of the reduction of runs than other purchasers and carriers. Representatives of the company advised that Yates crude requirements would balance with demand under the new allowance, and that Humble Oil & Refining Company desired to maintain its original percentage of the allowable production. It was further stated that Humble Oil & Refining Company is chiefly suffering from excess oil takings in the Panhandle, Luling and Gulf Coast districts now that relief has been obtained in the Yates field.

Encouraged by the 30,000-barrel reduction gained from the Yates field, the general committee deliberated at length on the situation in the Panhandle and Refugio fields. Gray County is the main source of worry in the Panhandle, but since the first of the year has been lessened by voluntary enforcement of proration, with all but a few companies participating. The general committee is reported to have formed the opinion that the Panhandle district as a whole is doing its share in aiding the general curtailment program, and that further reductions through artificial means will not be asked of the operators as long as their conservation plan remains in effect. Gray County has a large volume of prolific oil producing area awaiting

Developments in Acid Bottle Surveying Aid Accuracy

By BRAD MILLS
Staff Representative

USE of the acid bottle test to determine the deflection of a drilling well from the vertical was not originated in the Santa Fe Springs field, but the present high state of development of this method of surveying holes has resulted directly from a long series of experiments in this deepest California field.

The principle of the acid bottle test is simple. A round glass tube is partially filled with hydrofluoric acid, dropped into the hole and allowed to remain still for a short period, during which the acid etches a ring around the tube. The glass tube is drawn from the bottom of the hole and the etched ring scaled against a thoeretically horizontal ring. The deviation from the vertical is easily calculated by this procedure.

The idea of the acid bottle was borrowed from the mining industry, small diamond drill holes having been surveyed by this method some time before its application to the oil industry. Early attempts to survey holes drilled for oil were made by running acid bottle on the end of bailers. Later the bottles and containers were run with heavy wires. Both of these methods were slow and unsatisfactory for several reasons.

McDowell Graves, petroleum engineer for Associated Oil Company at Santa Fe Springs, early saw the possibilities of the method and started a long series of experiments with various containers. Out of these experiments grew the improved method of today, which is used with various modifications by almost every large operator in the field. Other California fields have adopted the basic principles of the Graves method. The percentage of breakage was high in early attempts in deeper wells, but the present container has been so perfected that an acid bottle is seldom broken, even if dropped to a depth of 8000 feet.

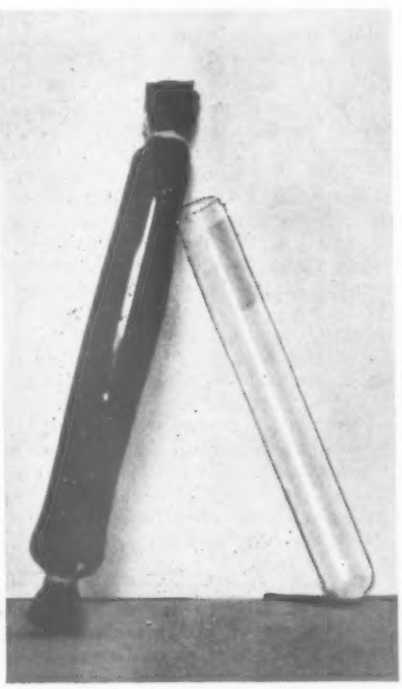
Early Success

Nearly a year ago Associated Oil Company determined through the use of the acid bottle that Dewenter 8 at Santa Fe Springs was crooked. The hole had been drilled to 3420 feet, but a careful survey showed that the deflection started around 3065 feet. By plugging back and straightening the hole, the well was continued successfully and completed as a 2500-barrel producer in the O'Connell zone at 6836 feet. Application of the acid bottle had been so successful that the company immediately adopted this method for determining the deflection of the various drilling wells. There was room for improvement, however, and the company lent its support to experiments which eventually led up to the present standard.

The commercial hydrofluoric acid used is of about 50 per cent strength. One part of acid to two parts of distilled water forms the most effective mixture, although a stronger solution was used during early experiments. The mixture which gives the best etching effect without forming a blurry ring is the ideal solution.

The container or apparatus which is dropped into the well, as designed by Graves, is a hand-made arrangement and designed to drop with the greatest possible speed without breakage to the acid tube. Early models were accurate enough, but they naturally had flaws.

Principal parts of the Graves acid bottle container, from top to bottom as the apparatus goes in the drill pipe, are a steel tube for holding the bottle and acid, a heavy steel coil spring to receive the impact against the drill collar in the bottom of the hole, and a seamless steel tubing mosquito bill to fit inside the drill collar while the apparatus is at rest on the bottom of the drill pipe. Length over all of the container and seamless tube is five feet and eight inches.



Acid tube and live rubber container used in Graves method

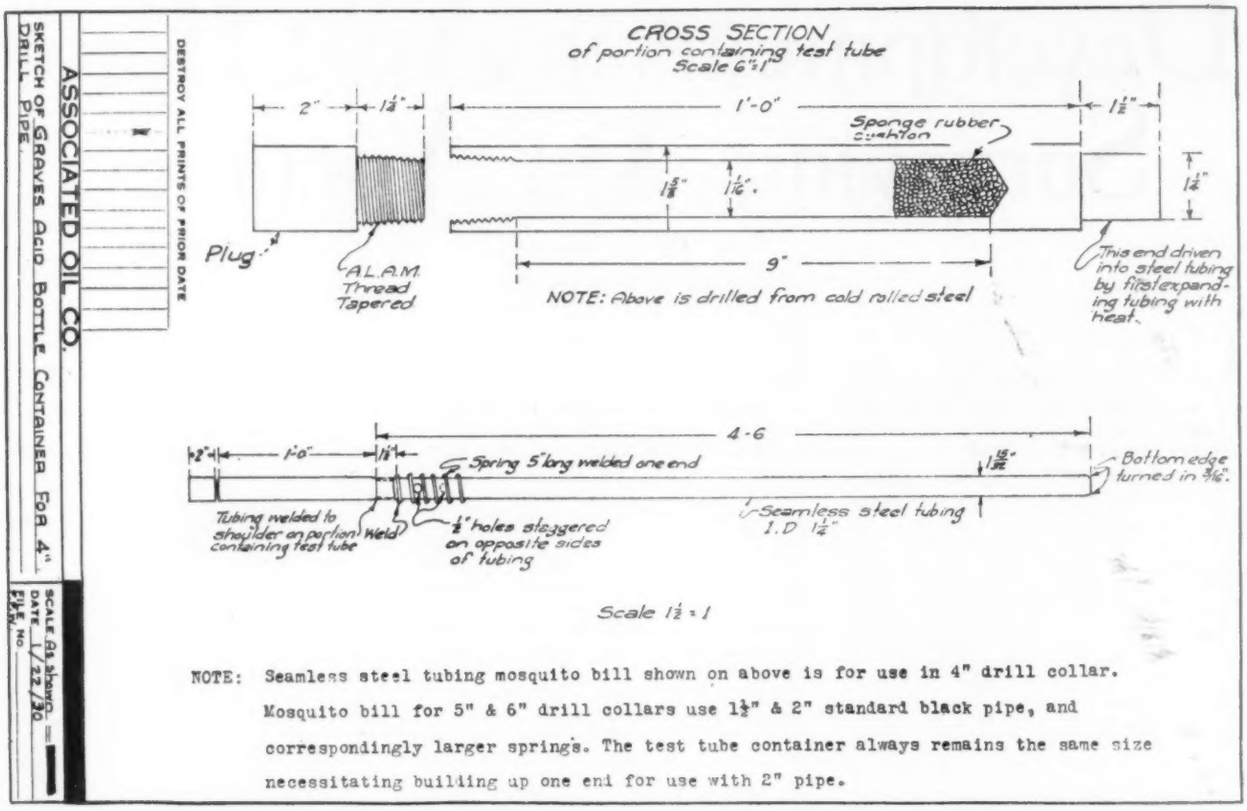
The tube which holds the acid bottle is machined from a piece of cold rolled steel shafting. When used in any size drill pipe, diameter of the shafting is 1⅝-inches. Overall length of the shafting is 13½-inches. One and one-half inches of the bottom end is machined to a diameter of 1½-inches, thus forming a 3/16-inch shoulder. This leaves one foot of the shaft 1⅝-inches in diameter. From the upper end, a 1 1/16-inch hole is drilled nine inches into the shafting, changing it into a cold rolled steel tube. An A. L. A. M. tapered female thread is cut in the opening. Thickness of the finished tube or acid container is nine-thirty-seconds of an inch.

The plug which screws into the top of the steel tube is made from a short piece of the same shafting. Its overall length is three and one-fourth inches, of which one and one-fourth inches are made into an A. L. A. M. tapered male thread. The exposed end of the plug is two inches long and remains the original diameter of the shaft. This type of thread has proven especially satisfactory.

"Mosquito Bill"

The mosquito bill which joins on to the bottom of the steel tube just described is made of seamless steel tubing having an outside diameter of one and fifteen-thirty-seconds inches and an inside diameter of one and one-fourth inches, if for use in four-inch drill pipe. Total length of this tube is four feet and six inches. The smaller, or bottom, end of the short steel tube designed to hold the acid bottle and described in a previous paragraph is driven into the upper end of the mosquito bill by first expanding the latter with heat. Although rated as the same size, the fit is extremely tight when both are cold. The top of the mosquito bill is jammed close against the shoulder of the bottle container. A strong weld is made as this point of contact. The bottom edge of the guide or mosquito bill is turned in about three-sixteenths of an inch to prevent striking upsets on its way down. One-half-inch holes are staggered on opposite sides of the mosquito bill near the top to allow exit of the fluid entering the bottom end.

A heavy coil spring about five inches long is slipped over the mosquito bill and the top end welded at a point one and one-half inches below the top or shoulder weld. This spring has a



NOTE: Seamless steel tubing mosquito bill shown on above is for use in 4" drill collar. Mosquito bill for 5" & 6" drill collars use 1½" & 2" standard black pipe, and correspondingly larger springs. The test tube container always remains the same size necessitating building up one end for use with 2" pipe.

double duty to perform, as will be shown in later paragraphs.

All parts described in foregoing paragraphs are for use in four-inch drill pipe, with the exception of the acid bottle container. The mosquito bill for five-inch and six-inch drill collars use 1½-inch and two-inch standard black pipe, respectively. Correspondingly larger springs are also used. The test tube container always remains the same size, necessitating the building up of one end for use with the two-inch pipe.

As will be noted later, size of the mosquito bill must be very exact with reference to the size of the drill collar, eliminating the possibility of leaning out of line with the true course of the hole.

The glass test tube used to hold the acid is seven-eighths of an inch in diameter and seven inches long.

A recent improvement is the use of a bottle protector, which is made from a piece of old inner tube. This sheet of live rubber is wrapped around the glass tube and tied at both ends. Tied in the upper end of the protector is a piece of sponge rubber which acts as a stopper. The sheet rubber is cut a little short to make the acid bottle fit snugly. The company has not broken a bottle since this simple protector was designed.

The bottom end of the steel tube container is packed with sponge rubber which acts as a cushion at the moment of impact. The end of the sheet rubber protector rests against this sponge rubber cushion, making breakage almost impossible.

Practice will enable a crew to use the acid bottle method with ease. The usual procedure is to place the test tube container in a strong vise, care being taken to apply white lead liberally to threads of the plug. After the kelly is backed off the drill pipe, the acid is placed in the glass test tube to a depth not to exceed one and one-half inches. The test tube is placed in the live rubber protector and slipped into the container, care being taken to work as fast as possible to prevent the acid from prematurely etching the bottle. The apparatus is then dropped into the drill pipe.

The size of the drill pipe and weight of the mud fluid often determine the speed of the apparatus on its downward course. The usual rate of the drop varies from 500 feet to 1000 feet per second without use of the pump. By placing the ear to the drill pipe or using a stethoscope it is possible to roughly determine the elapsed time of the drop. After the apparatus has reached bottom, the drill pipe may be raised and lowered slightly during the 10-minute period during which the acid is etching the bottle.

During the downward course, the constant movement of the acid prevents it from etching the bottle to any great extent. It has also been found that the acid loses much of its strength during the drop and while it is etching the glass tube.

When the container is lifted from the drill collar, after pulling drill pipe, the plug is removed and glass tube withdrawn, removed from rubber protector and thoroughly washed with clear water. It should be swabbed and wiped dry before attempting to read the angle.

The time lost is negligible, when the value of knowing the course of the hole is considered. Total elapsed time varies from about 15 minutes in shallower holes using large drill pipe to 25 minutes in holes deeper than 6000 feet and using three-inch drill pipe. This variation is largely caused by the time required for the apparatus to reach bottom. If the container drops at too fast a rate, the impact upon reaching bottom may shatter the glass tube containing the acid unless this impact is cushioned by the spring previously described and the live rubber container is used.

When the apparatus is at rest in the bottom of the hole, the mosquito bill is inside the drill collar. The spring rests against the top of the drill collar, being larger than the opening. Thus is serves the double purpose of cushioning the impact and holding the container in place. The mosquito bill fits so snugly in the drill collar that the acid bottle container above is correctly lined up with the course of the hole and a true etching made.

It has been found that by taking an acid bottle reading each 100 or 200 feet, or each time the drill pipe is pulled, the deflection of the hole is known and there is a chance of plugging back and redrilling as soon as this deviation from the vertical becomes pronounced.

The method of reading the etched ring inside the glass tube is simple. By gluing an arm protector and goniometer on a small one-inch board and holding the etched tube against the edge of the board, the deviation from the true horizontal ring is readily obtained. The ring should be turned until the greatest deviation is registered. More elaborate methods are used by some companies.

Infantas Field Development Remarkably Successful

By ROY E. LEIGH
Special Foreign Representative

ALONG with other South American oil fields, many of which are as yet undeveloped, the existence of Infantas field, near El Centro, in the interior of Colombia, has been known since Spanish colonial days. Spaniards found oil seepages at Infantas during the earliest explorations of the Magdalena Valley; but, oil being of no importance in their scheme of life, the deposit was left undisturbed until citizens of a nation then unborn should discover the economic value of petroleum. Thereafter, these marvelously fertile sands remained, perforce, untouched for still another generation until petroleum engineers, gaining experience in more accessible districts, could invent and develop methods and machinery adequate for their exploitation.

Roberto de Mares, a French engineer who migrated to Colombia and interested himself in the development of the natural resources of his adopted country, made a survey of the Magdalena Valley shortly after the beginning of the present century in search of rubber. Finding oil instead, he sought and obtained from the Colombian government in 1905 a concession authorizing him to undertake the development of a tract of more than 1 1/3 million acres of land bordering on the Magdalena River for a distance of 70 miles and having an average width of 30 miles.

Lacking capital to support such a tremendous enterprise, he sought unsuccessfully for more than a decade to find financial backing. Meanwhile, automobiles and internal combustion engines were being perfected; and America was producing a generation of pioneer oil operators who recognized no barriers, geographical or climatic, in their search for petroleum.

American Capital Interested

Continuing his search for capital, de Mares came in contact with J. C. Trees and M. L. Benedum, George W. Crawford, president of the Ohio Fuel Corporation; J. S. Weller of the Standard Oil Company, and John W. Leonard of Pittsburgh, who organized the Tropical Oil Company in 1916 and paid into its treasury more than one million dollars, with which to commence development.

Purchasing three drilling rigs which marked the grave of another Colombian oil enterprise, the American adventurers shipped them up the Magdalena River to Barrancabermeja, where they were dismantled and transported, piece by piece, in *cayucas* or dug-out canoes, to a location near the seepage. Fortunately, the first well was productive, as also were the second and third; and, in 1920, the existence of oil in commercial quantity having definitely been proven the Tropical Oil Company was able to interest the International Petroleum Company, Ltd., subsidiary of the Imperial Oil Company of Canada, in the venture and arrangements were completed whereby the International assumed control of the operations.

Thenceforward, activities were extended and operations were expanded on a scale possible only to one of the strongest oil companies in the world. In 1921, the concession produced some 66,750 barrels of oil. Drilling was continued and, in the following year, production was increased five-fold. By 1924, potential production had been increased until the construction of a pipe line seemed warranted; and a contract was made for that purpose with the Andian National Corporation, financed capital, which corporation had a pipe line concession from the government.

Kenneth Startzell, gang-pusher for Tropical Oil Company, looking down on one of the seepages which led to the discovery of the Infantas field, in Colombia

The route had been surveyed in 1921 by M. M. Stuckey, a pipe line engineer of extensive experience in the United States; and the pipe was ordered on January 1, 1925. Construction was completed on April 4, 1926; and the Infantas field, being opened up to the full capacity of the line, then 30,000 barrels per day, achieved a record of more than six million barrels for the year. Production was more than doubled in 1927, and increased again by nearly 40 per cent. during the following year.

Year	Barrels
1921	66,750
1922	322,786
1923	424,875
1924	444,744
1925	1,006,708
1926	6,443,587
1927	15,014,474
1928	19,896,797
1929 (estimated)	20,000,000

Meanwhile, the field having been extended and production having been found on other structures nearby, the pipe line was looped, its capacity having been increased by additional facilities installed during the cur-

rent year to a total of 52,000 barrels per day. The Infantas and La Cira fields produced nearly 10 million barrels of oil during the first half of 1926; and, with increased pipe line outlet, there is every possibility that a new production record will be established before the end of the year.

Month	Barrels
January	1,674,245
February	1,499,326
March	1,677,010
April	1,623,448
May	1,779,877
June	1,741,115
Total	9,925,021

When the Infantas and La Cira fields were visited by THE OIL WEEKLY's foreign representative during the course of his South American tour, the Tropical Oil Company had an average production of around 56,000 barrels per day from 370-odd wells, of which about 80 per cent. were flowing. The Infantas field, which yields 25-26 gravity oil from depths ranging from 1200 to 2700 feet, is only about two-thirds developed. The La Cira structure, four kilometers west of the Infantas anticline, has three productive zones ranging from 500 to 3500 feet in depth; but it has been drilled only about 25 per cent. of its limits.

Importance of De Mares Concession

These two developed fields, however, do not indicate the full possibilities of the de Mares concession. To quote from The *Lamp*, it was known as long ago as August, 1926, that " * * * A geological survey had demonstrated the existence of four structures within a radius of 50 miles. The Infantas structure * * * has been since proven to have an area of more than 4000 acres. * * * No well has yet reached the bottom of the potential oil horizons. The largest showed a flush production of 9000 barrels per day.

"Two other structures, the potentialities of which are not yet definitely defined, have been located. La Cira structure, four kilometers to the west of Infantas, was proven in 1925 * * * . The San Luis structure, 24 kilometers to the southwest, was proven this year."

Further exploration of the San Luis structure has not been hastened, although six wells have been drilled and oil has been found in three. No. 1 was abandoned as dry at 2260 feet; but No. 2 was drilled to a total depth of 3098 feet, at which point it produced around five barrels of 38 gravity oil per day. Drilling is still in progress in No. 3. Nos. 4 and 5 were finished in shallow sands, at depths of 1853 and 1423 feet, respectively. One is classed as a 40-barrel well, and the other as a five-barrel well. These shallow sands were found to have thinned out in No. 6; and a deep test was made, the hole finally being abandoned at 4688 feet.

Three rigs are in operation on the Colorado structure, 14 kilometers south of Infantas field, where a gas blow-out occurred three years ago and where oil production is sought at depths ranging from 5500 to 6000 feet. No. 1 was a shallow test, of no consequence. No. 2 yielded four million cubic feet of gas and a show of oil from a depth of 3640 feet. No. 3 was never drilled; and No. 4 was abandoned as dry at 3440 feet. No. 5 brought a renewal of hope, as showings of 36 gravity oil were found before the hole was abandoned because of mechanical difficulties at 5370 feet. Nos. 6, 7 and 8 are now being drilled at depths below 5000 feet.

Hydraulic Mining Methods for Mixing Rotary Mud

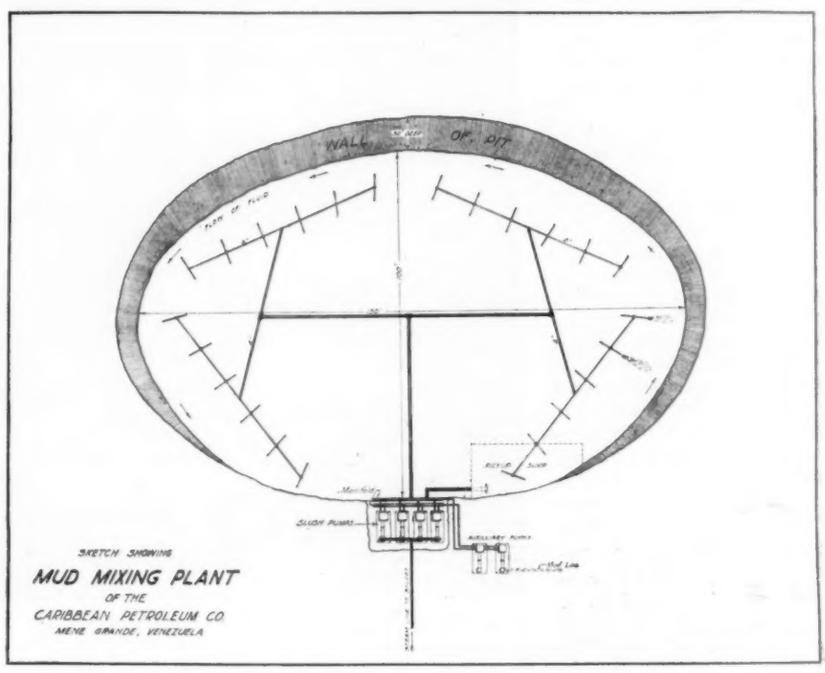
CARIBBEAN Petroleum Company, whose drilling department is organized by California talent, has solved the mud-fluid problem of the Mene Grande field, in Venezuela, at one bold stroke. Finding a suitable deposit of clay soil at a point convenient to the center of operations, batteries of pumps and boilers were installed in a plant designed to supply mud to the entire field.

Pump power is supplied from six 12 x 6¾ x 12 slush pumps, hooked up so that, if necessary, all six may be compounded to pump heavy mud to the rigs. Ordinarily, only one or two pumps are required for mixing, two others being used to pick up and deliver the completed mud into the field lines. Four of these pumps are installed in a depression excavated out of the side of the pit, two others being placed at ground-level for auxiliary service. At the start of the mixing operation, fresh water is applied under pressure to the bottom and walls of the pit, its dydraulic action being sufficient to cut away clay particles and cause the mixing of mud and water. The water sprays are controlled through 24 "guns" mounted on flexible connections, their range embracing the entire area of the pit, as shown in the accompanying drawing. These guns are made of two-inch pipe, with one-inch swage nipples on the nozzle ends, into which are screwed three-eighths- to three-quarter-inch beans to further reduce the openings. Attendants —usually small native boys who marvel at the liberality of the gringos in paying them for playing in the mud—grasp the breech ends of the guns and sweep them about like machine guns, one at a time, washing mud up from the bottom of the excavation, taking care always to maintain suitable slopes and levels, so that mud will flow around the circumference of the pit and drain into the pick-up sump.

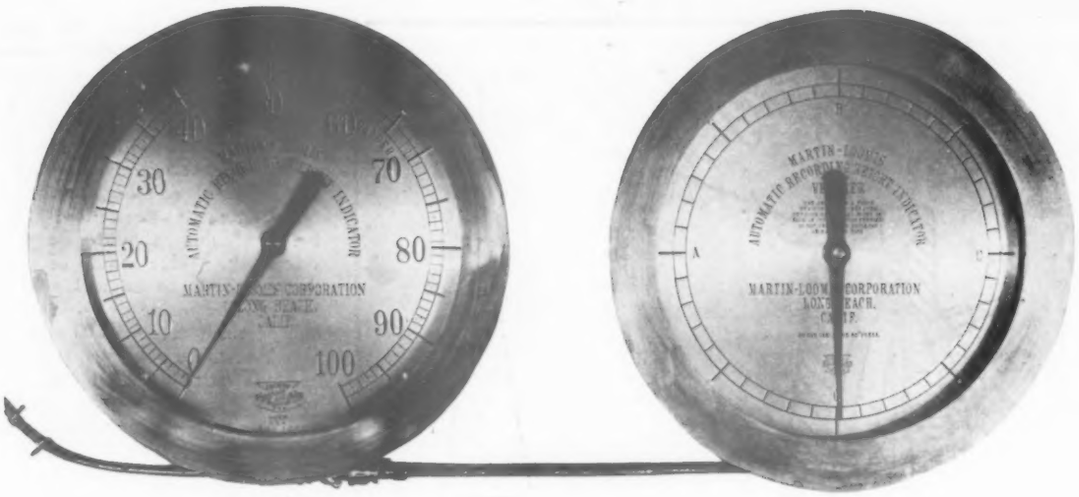
Normally, one circuit of the system is sufficient to produce a mud sufficiently heavy for ordinary drilling; but, if an extra heavy slush is required, the fluid is re-cycled as many times as may be necessary to develop a mud of sufficient weight to control well pressures.

Operations were commenced at ground-level; but, after several months, so much clay has been washed away that a pit 30 feet in depth and about 150 feet long by 100 feet in width has resulted. The excellent clay deposit which the company has the good fortune to possess shows no signs of exhaustion, either at the bottom or on the sides.

A system of six-inch mud lines encircle the field, with outlets at each rig, so that no driller is ever at a loss for circulating fluid.



SKETCH SHOWING
MUD MIXING PLANT
OF THE
CARIBBEAN PETROLEUM CO
MENE GRANDE, VENEZUELA



Weight Indicators *Should Be Treated as* Instruments

By GEORGE REID
Staff Representative

THE modern weight indicator has been on the market but a little over three years. Though it is often considered merely a piece of incidental equipment, it has been aptly designated as "the most important recent contribution to oil well drilling practice." Weight indicators are now on drilling wells in every oil producing country in the world—there are over 2300 in use. More and more is the value of these instruments being recognized in securing long bit life, freedom from fishing jobs, and in keeping the hole straight.

Until within recent months, most operators have used these instruments simply as a rough and ready means of comparison. Their principle of operation is such that they will continue to register variations in load with surprising accuracy, considering the size of the loads handled, without particular care in setting or maintenance. If they are to be used, however, as an instrument for actually measuring and recording the load in pounds, they must be used as an instrument and kept in adjustment. Field tests have shown that with indicators which have been in use almost three years, load measurements can be obtained within an accuracy of a few per cent. Certain fundamentals of the indicator must be observed to maintain accuracy. A recent development, the vernier gauge, will indicate variations as small as 10 pounds per line.

Present drilling to depths of 7000-8000 feet with drill pipe as small as 2⅛-inch has necessitated very careful handling of the pipe. Then, too, the time necessary to make a round trip from such depths has made it important to get the longest service life possible from the bits used. Fishing jobs at such depths may be disastrous. With the development of well surveying and the knowledge of the importance of bit feeding pressures on the straightness of the resultant holes, more care and attention is being given to this important subject. Consequently, it is more necessary than ever before that weight indicating instruments be properly used to obtain accurate results.

Fundamentally, the principle of the weight indicator is accurate. Used correctly, there is then no reason why it should not give results which are true to the actual load. Tests have proven that it will, even after years of service.

Principle of the Instrument

A review of the principle of this instrument will make clear, in conjunction with the description, why, if accurate load indications are desired, certain rules must be observed carefully. A deflection plug is used to put an offset of a definite amount into the wire line between two fixed points, a certain distance apart. The line is clamped to the body at the lower of these points. The upper portion of the line is not clamped but merely bears against the inner side of the hook. Inasmuch as the load must pass through the upper stretch of the line, it is important that no restriction be introduced at this point. Elimination of the clamping of the upper portion of the line permits the wires of the rope to adjust themselves to the load without inducing friction.

The deflection plug is backed up with a plate resting upon a very flexible composition diaphragm, behind which is a body of liquid connected through tubing to the gauge and recorder. To avoid kinking the line and to keep the hydraulic pressure low, this offset is but a relatively small amount. The relation of this offset to the distance between the bearing points at the clamp and hook determines the proportion of diaphragm pressure to the total load. It is therefore of vital importance that this offset be accurately maintained at zero position. A variation of one sixty-fourth-inch from correct setting will introduce a three per cent error. Since the weight indicator, the gauge, recorder and connecting tubing comprise a tight system, and liquid is virtually non-compressible, there is practically no fluid movement. Hence movement of any of the parts is very small. Actually, the deflection plug will move about two thousandths of an inch for each 15 pounds change in gauge pressure, due to the expansion of the fluid chamber and tubing. It is virtually a floating plug. It is partially for this reason that the calibration curve is not a straight line.

These instruments are made to register in accordance with the calibration curve shown in Figure 2, at a certain zero position of this deflection plug and at this position only. It is therefore important that this zero position be exactly maintained. If the system is pumped up to contain more liquid than the amount for

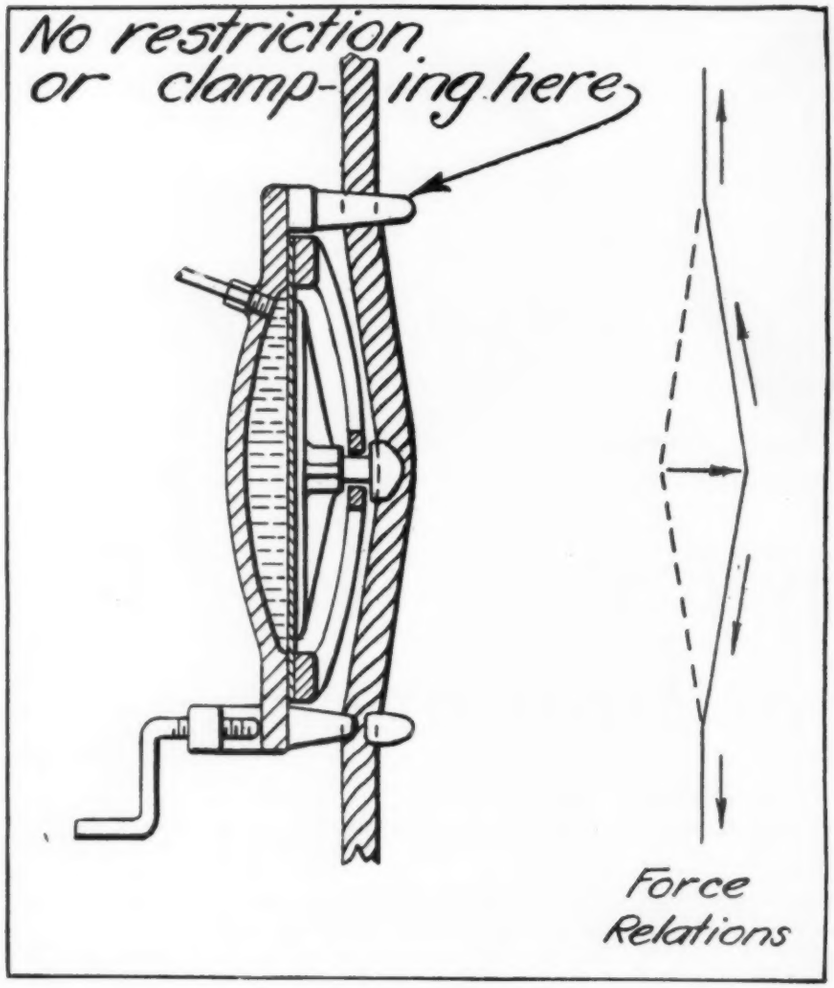


FIGURE 1
Diagramatic view of weight indicator diaphragm. (Offset in line exaggerated)

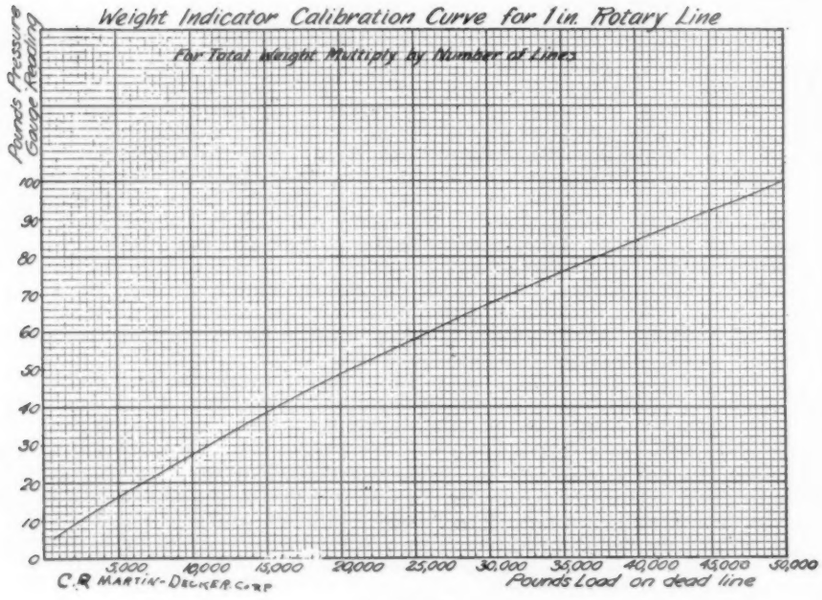


FIGURE 2

which it is designed, the plug will be pushed out further than normal and a greater offset will be made in the line. Consequently more pressure is required to maintain this greater offset, and the indicating gauge will register higher than it should. Accurately machined surfaces are provided on plug, bridge, and plate for gauging this deflection. The distance between plug shoulder and the outside of the bridge should be exactly three thirty-seconds of an inch. The distance between the inside of the bridge and the hub of the plate should be the same. To obtain accurate readings, this is then one of the first things to be checked on the instrument proper. Correctness of load register depends upon maintaining the correct deflection.

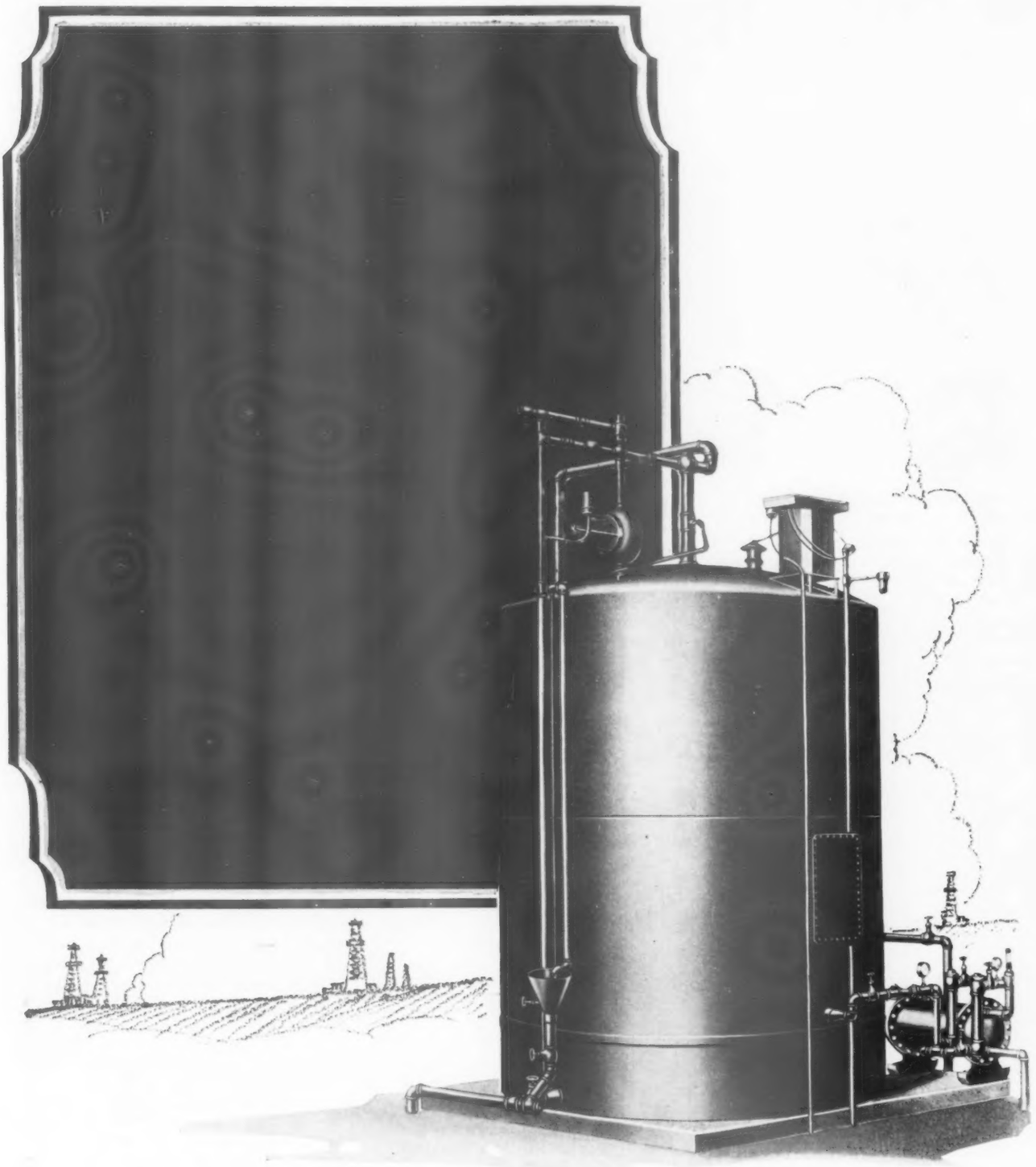
Of course if the dead line is not free, the instrument will not be sensitive in registering loads. The operation will be jerky. The dead line should not touch anything between the sheave and dead end at the diaphragm. The dead line sheave on the crown block should also be kept well lubricated and for the best results should be on anti-friction bearings. Friction does not introduce errors of vital consequence in determining bit pressures, as during drilling and even circulating the vibration of the rig loosens up any friction. But where accuracy is desired in handling light loads or to show small load variations, as in fishing, more care must be taken to keep the dead line sensitive to small load changes.

Setting of Diaphragm

Another point that is frequently overlooked, is the position of the diaphragm on the dead line. When convenient the diaphragm and indicating gauge should be at the same level. If they are not, for every two feet four inches difference a correction of one pound must be made. That is, if the gauge is two feet four inches higher than the diaphragm, it will read one pound light; if that much lower, it will read a pound too high. This is likewise the case with the recorder. The hands may be set to take care of this correction automatically.

It is important that there be no binding in any part of the instrument itself. Inasmuch as the only moving part, if a few thousandths may be called movement, is the deflection plug and plate, a little care to keep mud and dirt away from this part will prevent any such possibility. The plug is guided in a loose bore in the bridge just as close to the line as it is possible to get and there is a large clearance between the diaphragm plate and the body. It is almost impossible to bind the plug if the hose is turned on it occasionally to keep it washed off.

Inasmuch as all instruments of this type operate through a closed fluid system there is a slight effect from large changes in temperature. This is due to expansion and contraction of the fluid. True, the diaphragm unit fluid chamber and tubing likewise also change their volume, but the change in temperature is not nearly as rapid as that of the fluid change. The driller should occasionally lift off bottom and note the basic reading. This is particularly important during



PETRECO

Fully covered by process and apparatus patents.

changes in temperature such as between early and late morning and afternoon and evening. It may also be compensated for by pumping in or bleeding out a little fluid as may be required. The amount of fluid in the system of the weight indicator has been kept small, and hence the effect of temperature changes is minimized. The effect is more noticeable where anti-freeze solutions are used. Temperature effects are inherent in any measuring system except when compensated by special arrangements. Even the most simple coil spring will vary in its load supporting capacity with the temperature. Because of the enormous loads handled and the reduction necessary to read them on a simple fluid system, the temperature corrections of weight indicating instruments used in the oil fields is much more noticeable.

Gauges should be checked at frequent intervals, either with a test gauge, or a previously calibrated gauge. This may be done without removing the indicating gauge from the rig, by simply connecting the test or calibrated gauge to the pump connection on the recorder, or to the "T" connection at the indicator gauge and comparing the readings. If connected at the recorder, the difference in head must be taken into consideration and the corresponding correction made as mentioned above.

Weight indicators gauges are specially selected for their accuracy and are rejected if they do not register within very close limits. They are made exceptionally rigid for oil field service and are more accurate and sturdy than the usual pressure gauge. Gauges that have been in service almost three years show very little variation. Occasional calibration as above outlined will catch any errors before they become large enough to affect the readings. Gauges may likewise be roughly checked by comparison with the actual loads hanging on the hook if the diaphragm unit has first been put into proper adjustment.

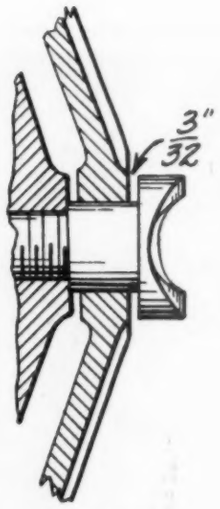


FIGURE 3

Zero position of plug must be observed in pumping in fluid

Weight of Drill Pipe

In Figures 4 to 7 are given curves showing the weight of various lengths of the different sizes of A. P. I. standard drill pipe in mud of varying specific gravities. Sometimes the static weights obtained from indicator readings will not check closely but will be somewhat under those shown by these curves due to the support given the pipe by the walls of the hole, especially if the bore is at all crooked. This effect is usually very small, however. The curves are based upon the following data:

6⅝-in. 22.186 lb. with tool joints weighs .....26.38 lb/ft.
5-9/16-in. 19.590 lb with tool joints estimated .....23.20 lb/ft.
4½-in. 14.983 lb. with tool joints estimated .....17.83 lb/ft.
3½-in. 12.309 lb. with tool joints estimated .....14.64 lb/ft.
2⅞-in 9.715 lb. with tool joints estimated .....11.56 lb/ft.
2⅜-in. 6.264 lb. with tool joints estimated .....7.45 lb./ft.

The maximum variation between used and new pipe and various types of tool joints would probably introduce an error of not over two per cent. Weight of block, hook, kelly, bit and drill collar must be added to the readings obtained from the curves. Likewise, the length of bit and drill collar and the length of the kelly below the table must be subtracted from the total depth in using the chart.

These weights may be used to check indicator readings if the hole is not too crooked. They may also be used to give an indication of the crookedness of the hole, although, except for excessive deviations, the weight variation will be small. In checking weights, however, it is well to first check the indicator with about a thousand feet of pipe on the hook, keeping the rotary turning slowly to slightly vibrate the rig, and operating the mud pumps at very low speed.

If the indicator does not check fairly close with actual weights, it is possible that the clamp or hook has been distorted by hammering or negligent handling or that the bridge has been sprung by pumping up the hydraulic pressure too high. In checking with the thousand feet on the hook, if the gauge and plug deflection have been found to be alright, it is possible that one of the above may be the cause of the discrepancy. If so, pumping up the diaphragm until the reading is normal will correct the difficulty. This should be further checked under other loads. Increasing the plug deflection as above should only be done after every other item mentioned has been checked. It is usually not a good plan to use the "zero" readings of the indicator under the weight of the blocks alone for setting. For one reason, the friction in crown and traveling blocks is not overcome by the vibration as during drilling and the percentage of error introduced under such a small load may be greatly influenced by the friction. Although friction may interfere with the readings of extremely light static loads, it does not affect the accuracy of drilling loads nor the indication of extremely small variations in load,

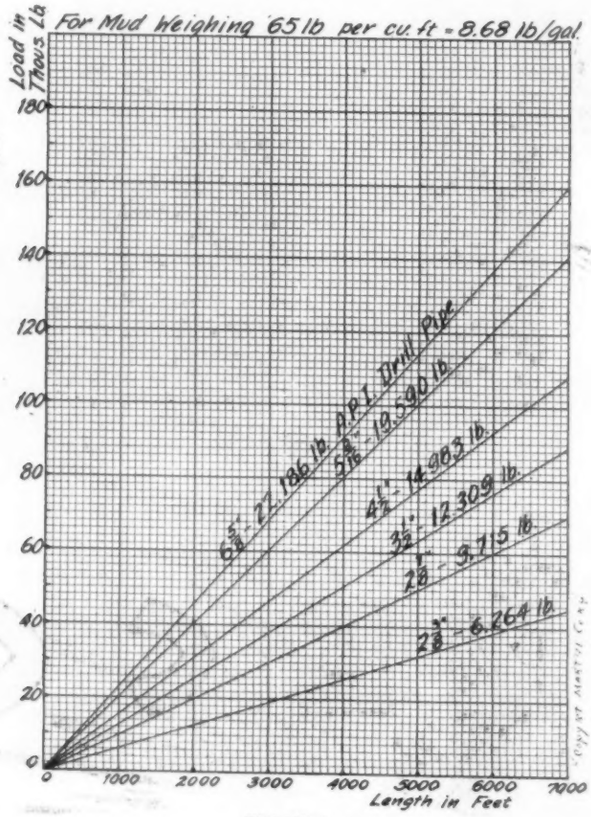


FIGURE 4

A CITY OF TWINKLING TOWERS . .

There is no more fascinating sight than that seen on approaching an oil field at night... a fairy land with towers of twinkling lights. But electricity's contribution is much greater and more important than mere beauty. Electricity has lengthened the day for the oil field operator. It lessens the number of accidents. It enables the drillers more quickly to reach pay sand.

On entering the field, one hears humming motors the mighty power of which pulls up a string of steel that hangs a half-mile or a mile down into the earth. Electric driven mud hogs circulate mud and water up and down these great depths.

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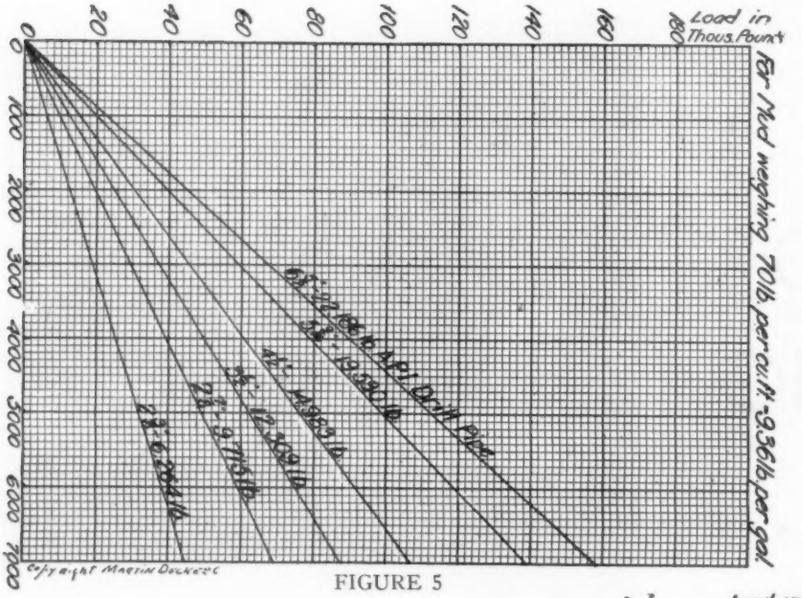


FIGURE 5

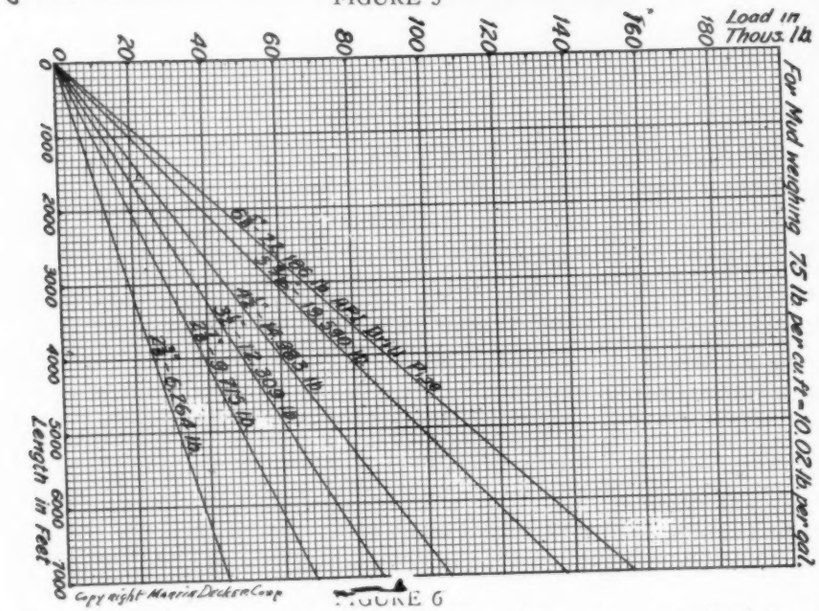


FIGURE 6

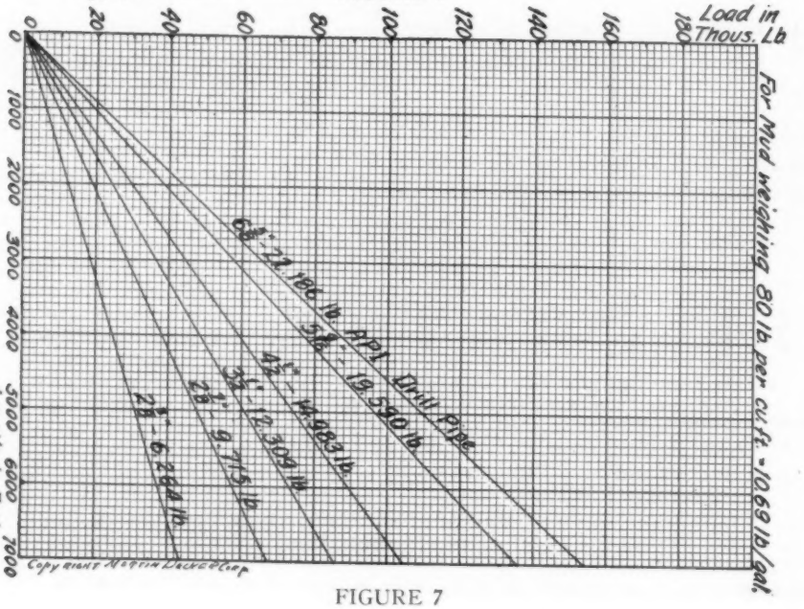


FIGURE 7

especially if the rig is in vibration, as it is during all drilling operations.

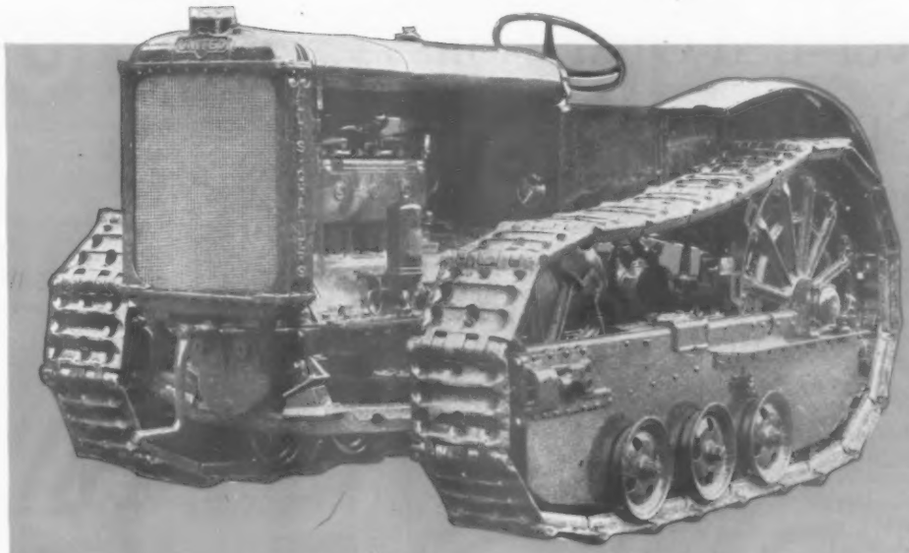
Extra Sensitive Readings

For extra senstive readings a vernier gauge may be set up beside the regular gauge. This vernier is six times as sensitive as the regular gauge and is being used for handling small drill pipe, obtaining the correct drilling pressures on small bits, indicating the pick-up of small fish, and the instant of contact with them, as well as for milling and tapping operations. Many of the companies are using this gauge in actual drilling operations even with large size bits so that the driller is able to hold his bit weight closely to the desired amount. When used with roller bearing traveling and crown blocks, a change of load as small as 20 or 30 pounds may be detected. The movement of the gauge hand is approximately an inch and a half per pound pressure which makes visible a variation of as little as a fiftieth of a point. The fact that this gauge is used in conjunction with the regular diaphragm indicates the extreme sensitivity of the weight indicator diaphragm unit.

It must be remembered that the best penetration of a rotary bit is not secured by a dragging action. The drill pipe acts as a long spring to keep the bit continually in vibration so that actual drilling is accomplished by a series of blows. The effect is similar to that of an air hammer which is well recognized for its ability to penetrate even the hardest formations. The inter-position of weight limiting devices in the drill string interferes with the spring action of the drill pipe and necessarily slows up drilling.

In conclusion, the weight indicator is basicly an accurate load measuring unit for loads of the extreme weight handled in the oil derrick. Under extreme neglect it will still measure load variations sufficiently close for usual drilling. With care and occasional checking, it will give uniformly accurate weights of loads handled. Observation has shown that the most frequent operating error is in pumping in too much fluid. Dead lines should be kept free of the rig, fourble, and double boards. Actual service tests have proven that with no more than occasional attention and checking weight indicator readings will check consistently within five per cent of the actual loads handled.

Tulsa.—Jackson & Wise, Inc., of Sapulpa, has purchased all of the holdings of Mid-Kansas Oil & Gas Company in Nowata and Washington Counties, Northeastern Oklahoma. Production of the 16 leases included is now quite small, but there are a number of undrilled locations. The properties were secured by Mid-Kansas Oil & Gas Company in 1923, from Waite Phillips, then an individual operator. The net consideration was not made known.



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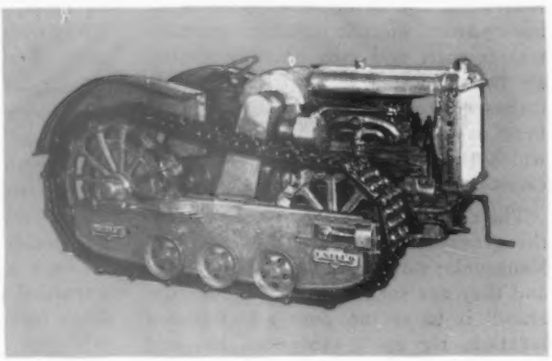

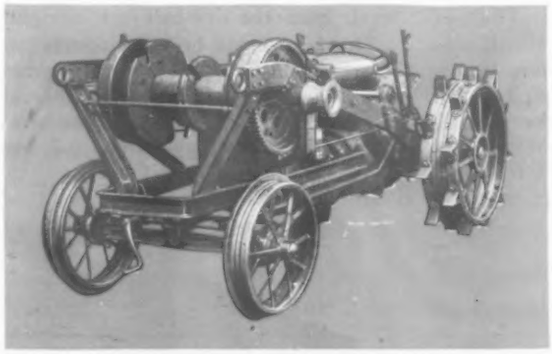

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Ventura River-Bed Operations Require Special Methods; Ingenius Appliances

THIS peculiar contrivance, which looks like a cross between a drilling machine and a pile driver, is used by Shell Oil Company in its river-bed operations at Ventura, California. The Ventura "river," as it is called, is one of those innocuous-appearing California water-courses which develop tremendous powers of devastation when they go on rampages at infrequent intervals during periods of rainfall. Derricks and other structures erected in the path of these ravaging floods must be built on secure foundations, if they are to endure.

Shell Oil Company's rigs are built on concrete pile foundations, which penetrate 30 feet down to bed-rock. These pile foundations are installed by means of a home-made rig which partakes of the dual nature of spudding machine and pile-driver. It has a 40-foot mast and is equipped with a 40-horsepower electric motor, portable transformer, and two hoisting drums, all built on a frame-work of 16 x 16 inches redwood timber, the lower members of which consist of ruduers on which the rig is skidded from one location to another.

The concrete piles are not driven into the ground, as at Maracabio Lake, in Venezuela; rather, a hole is drilled first and they are set in it. The modus operandi is to set up over a designated location, rig up a cable-tool bit, and start punching away on the pile-hole. There is a clutch between the drum and the motor, which is used in imparting the up-and-down motion to the bit. As a matter of fact, there is no continuous motion of the drilling tool, as is possible with the use of walking-beam. The clutch is thrown in and the line is wound up on the drum until the bit is raised to a sufficient height, whereupon the clutch is disengaged and the bit falls with sufficient force to drill the shallow holes required. A wooden conductor pipe is driven down following the bit, during which operation the home-made rig serves as a pile-driver, a hammer being substituted for the cable-tool bit.

On reaching the desired depth, the pre-cast concrete pile is lifted upright and set inside the conductor pipe, whereupon the wooden casing is pulled and salvaged and the soft sediments of the river-bottom are allowed to close in around the pile.

Aerial Cable-Way

By resorting to well-known engineering devices not commonly used in oil fields, Shell Oil Company has definitely overcome the hazards and handicaps of river-bottom operations.

During the last flood season, the company's private bridge across the river was washed away; but this was not permitted to interrupt drilling, not even during the period of reconstruction. Two A-frames made of four-inch pipe welded together were erected, one on each side of the river; and an old discarded drilling line was strung over them for the purpose of transporting drill pipe and casing across the turbulent stream. The pipe was handled, one joint at a time, by means of two pulleys suspended from the aerial cable. Hooks dangling from the pulleys were inserted, one in each end of the pipe; and the joint was hoisted off the ground, to a suitable height, by means of a windlass arrangement. This traveling device was pulled back and forth across the river by hand.

Home-fabricated spudding and pile driving rig

Suspension Bridge For Pipe-Crossing

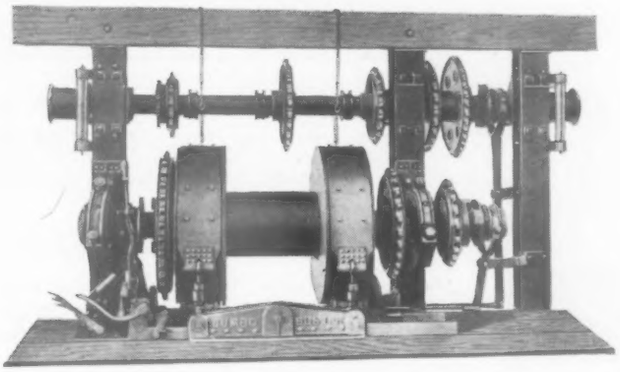
Pipe lines are suspended above flood-level by means of a suspension bridge, made entirely of material salvaged from the junkyard. The cable supports consist of two A-frames, made out of pipe and welded together, as in the case of the aerial cable-way. Dead men buried near each support provide stable anchorage; and the main supporting cables consist of discarded one-inch wire line, from which uprights of one-half-inch wire line are suspended by means of clamps. The pipe lines rest on four-foot nipples of two-inch pipe suspended, all at the same horizontal level, from the one-half-inch uprights.

This suspension bridge supports four lines—one a six-inch insulated steam line leading from a boiler station erected at a safe distance from the river, one a four-inch mud line, and two three-inch water and oil lines.

Shell Oil Company's Taylor 46, at Ventura Avenue. Note concrete pile in foreground

Aerial cable-way used by Shell Oil Company in transporting pipe across Ventura River

Kick-Back Eliminated by "Gumbo Buster"



The need for greater safety factor in modern drilling has been answered by the new "Gumbo Buster" Roller Bearing Draw Works which has a brake on which the leverage ratio is increased 2½ to 1. This eliminates kick-back of brake rod and enables one man to easily handle long strings of pipe. The brake bands are 13" wide and are equalized. The compound leverage and wide bands greatly increase the life of the brake linings.

1. All clutches are operated from drillers position by conveniently located foot pedals.

2. The 7" Line Shaft and the 8" Drum Shaft are of heat treated steel.

3. Drum operates on two large roller bearings enclosed in two self-aligning bearing housings.

4. All brake and clutch shifting rigging mounted on one base, which can be moved as a unit, facilitating setting up draw works, assuring proper rigid assembly.

5. Cat Line Rollers are extra large in diameter and operate on roller bearings.

6. Clutch blocks and sprockets are of chrome nickel steel; clutch blocks heat treated; heavy steel Jack Posts.

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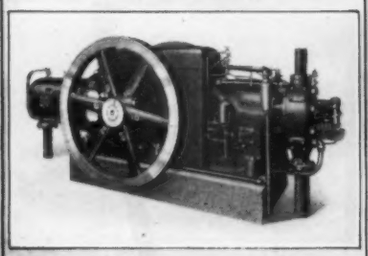

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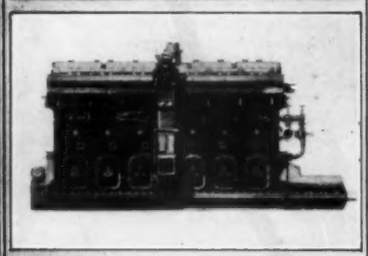

TYPE K.R.
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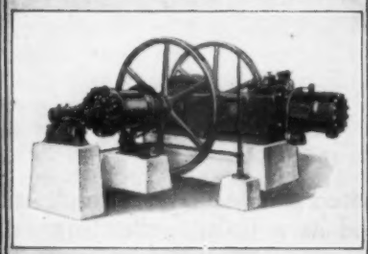

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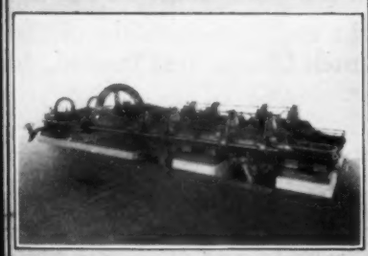

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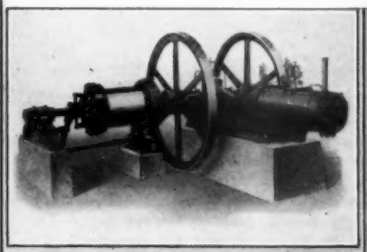

TYPE O.C.
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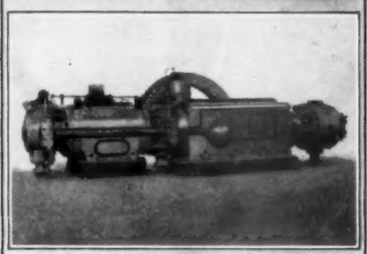

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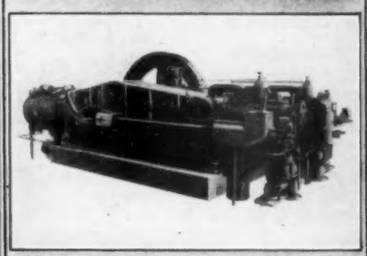

TYPE-80
(85 TO 190 B.H.P.)

CHIEF APPLICATIONS

TYPE	
16	Air or gas lift service. Natural gas booster station service. Repressuring oil sands. Compressing still vapors or weathering gases in refineries. Natural gasoline extraction in small plants. Belt-driving electric generators or power equipment.
O.C.	Oil well pumping.
K.R.	Driving oil line pumps. Direct-driving electric generators. Stationary power plants.
O.F.	Pumping oil or gas wells. Drilling oil or gas wells. Belt-driving air compressors or water pumps.
26	Main line compressor station service. Natural gasoline extraction in very large plants. Electric power station service. General power purposes.
40	Large natural gasoline extraction plants. Natural gas booster stations. Small main line compressor stations. Air or gas lift for flowing oil wells. Handling still vapors and weathering gases in refineries. Distributing manufactured gas.
80	Air or gas lift service. Handling still vapors and weathering gases in refineries. Natural gasoline extraction. Natural gas booster station service. Repressuring oil sands. Small main line compressor stations. Direct-driving electric generators or belted service.

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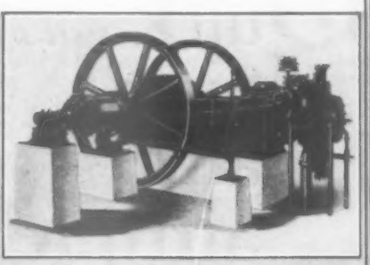
CHIEF APPLICATIONS

TYPE	
10	Air and gas lift. Natural gas booster station service. Small main line compressor stations. Repressuring oil sands. Natural gasoline extraction. Handling still vapors and weathering gases in refineries.
E.C.	Driving electric generators. Belted power for pumping stations. General power service.
FC-E	Oil well pumping. Driving pumping powers. Driving water pumps or air compressors.
E P	Direct-driving electric generators for auxiliary power in oil pumping stations. General power purposes.
22	Main line compressor station service. Natural gasoline extraction in very large plants. Electric power station service. General power purposes.
19	Main line compressor station service. Natural gasoline extraction in large plants. Medium size electric plant service. General power purposes.
VERTICAL	Furnishing power by belt-driving or driving electric generators for: Air lift for flowing oil or water wells. Auxiliary power in gasoline recovery plants and compressor stations. Isolated power plant service. Pumping plant service.



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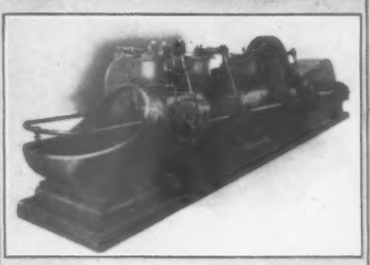

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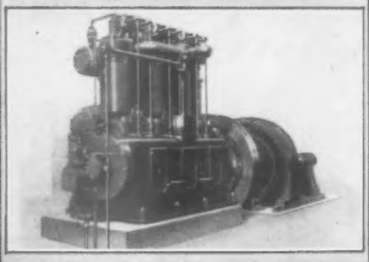
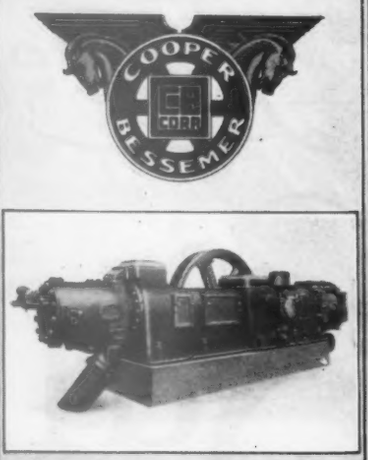


VERTICAL
(75 TO 565 B.H.P.)



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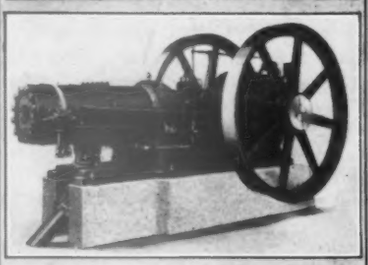
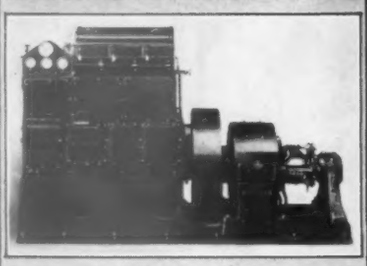


TYPE E.C.
(15 TO 200 B.H.P.)



TYPE E.P.
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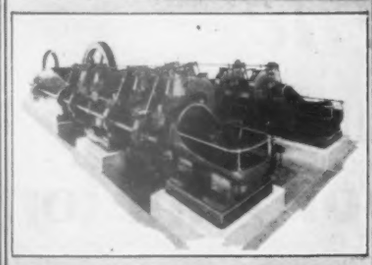

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Quick
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Storing Oil in Depleted Sand Successfully Tried

Tests indicate that inducted gas will recover stored oil when again required

By BRAD MILLS
Staff Representative

ANNOUNCEMENT several months ago that Union Oil Company was storing Santa Fe Springs crude in the practically depleted sands of the old Brea field attracted wide attention and immediately started a discussion relative to the merits of such a plan. In producing oil, transporting it to another field, pumping it into a sand and hoping to recover it at a later time, there is ample room for different opinions, but the fact that this is being done, and not the fact that it may or may not be a complete success, constitutes the most interesting angle of the unusual program.

In carrying out the storage plan, Union Oil Company naturally selected a lease which would probably return the bulk of the stored oil to its original owner and not to operators closely offsetting the property, as in the case of many Los Angeles basin fields. The lease is a large one and offsetting leases will receive benefits from the plan only in proportion to the quantity of oil stored.

The first well selected for use in storing the oil at Brea had been shut in in 1926, after producing more than two million barrels of oil. It was pumping 150 barrels daily at the time it was shut in. The well was reconditioned for the experiment, the casing and equipment having been unsuited to high pressures.

Prior to the storing of the oil in this old well, more than 600 million cubic feet of gas had been injected over a considerable period. By charging the sand, or forcing the gas into it ahead of the oil, a nearer ideal condition had been provided for the test. Incidentally, more gas was forced into the well than the producer had made during all of the years it had flowed and pumped. The gas-oil ratio of the Brea field has always been extremely low.

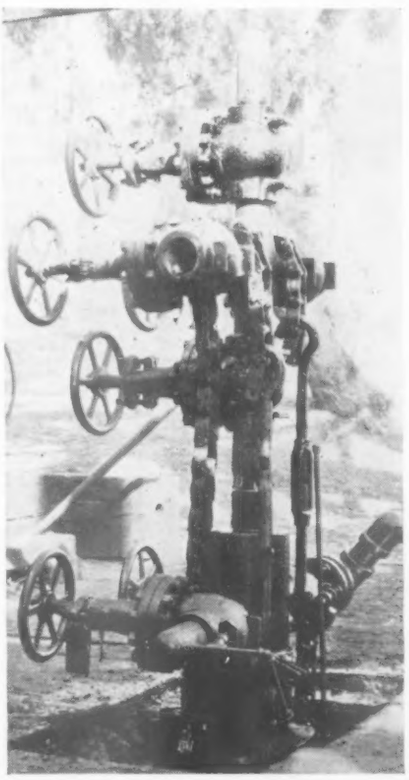
The company recently stopped storing oil, but is again forcing it into the sand. About 400,000 barrels of Santa Fe Springs crude has been stored since the inauguration of the plan. Injection is now going on at the rate of 2000 barrels per day. The sand is taking the oil with less resistance than ordinarily supposed.

The sand being used at Brea as a reservoir is about 3500 feet deep and is of a desirable texture for the purpose. The company expects to recover at least 100 per cent of the oil stored, with a possibility that enough of the heavier crude already in the sand will bring the ultimate total to a higher figure. Santa Fe Springs crude is about 24 gravity, while that already in the sand is around 14 gravity.

Due to the large quantity of gas sent ahead of the oil, it is believed that the cost of recovery from the 3500-foot sand will not be excessive. Both pumping and gas lift methods are readily available at such shallow depths. If the experiment is continued until the sand reaches a good percentage of saturation, the wells may flow for a long period.

The company is making a continuous analysis of the stored crude, making it possible to estimate the approximate percentage which may be recovered. The blending of the oil injected with that already in the sand reveals interesting data on perhaps the first attempt ever made to store oil in such a way.

A broken connection allowed an injection well to flow out of control for a short time and it was estimated that the well produced at the rate of more than 2000 barrels before repairs were completed. The action of this well was encouraging, although the test was in the form of an accident.



Connections on well used for inducting oil into depleted sand

Union Oil Company has announced that it is too early to make public definite results of the unique storage plan. Oil will continue to be stored for some time and at some time near the end of 1930, enough will have been learned concerning the experiment to give full details.

The very fact that the sands at Brea "take" the lighter Santa Fe Springs crude at a fairly constant rate is of considerable importance and out of the experiment may come facts which will lead to an underground storage system of some magnitude.

The mechanics of the injection method are very simple. When three wells were used for storing the oil, one large oil pump was used for each well. They normally operate under a pressure of 1000 pounds per square inch. Higher pressures were maintained in the beginning, but the casing gave way and extensive repairs were necessary. Three, 14 x 4 x 12 Snow steam pumps are being used. They had seen many years of service in moving oil before being installed for the underground storage project.

The surface arrangement at the injection well is about as simple as could be. A three-inch line leading from the pumps is connected to the casing head and the oil sent down the inside string of casing. A recording pressure gauge is used to check the pump pressure.

Experiments at Brea have shown old wells to be unsuited to high pressures, and since future storage of oil underground will of necessity be in the older fields, re-conditioning of such wells will be necessary before much headway can be made. The corrosive effects of water coming in contact with the outside of casing during several years of use has been proven at Brea, where high pressures caused trouble in these old, low-pressure water strings. It has required a much higher pressure to inject oil than gas in the same wells—a natural conclusion.

The desirability of injecting or storing oil in depleted sands as a means of holding back edge water has long been considered, and Union Oil Company's storage plan may throw some light on this angle, as well as on many others.

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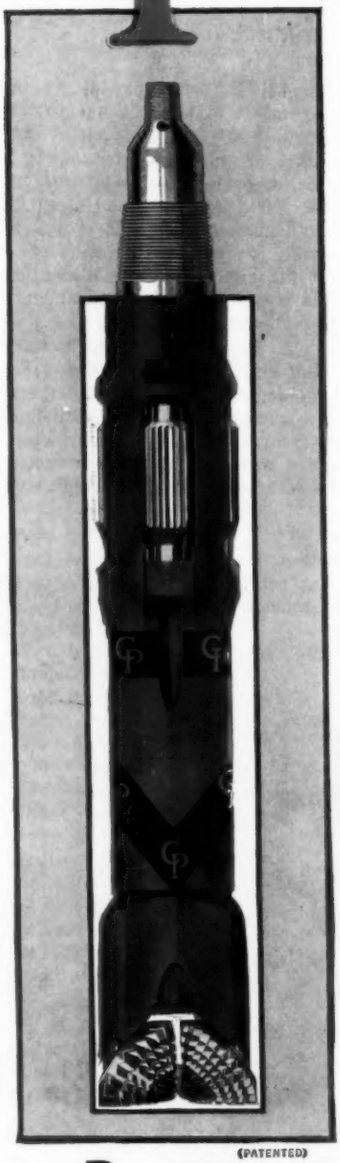
8. LOW MAINTENANCE —Body repairs eliminated. No wear on bit head or reamer body. MONEY SAVED
9. CONE SERVICE —New CP "Red Head" cutting cones can be refitted on your used bearings (only at authorized CP Service Stations) and guaranteed by CP to be as good as if a new bearing were used—at a great saving to you! ECONOMY



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Markets--Production--Crude Prices

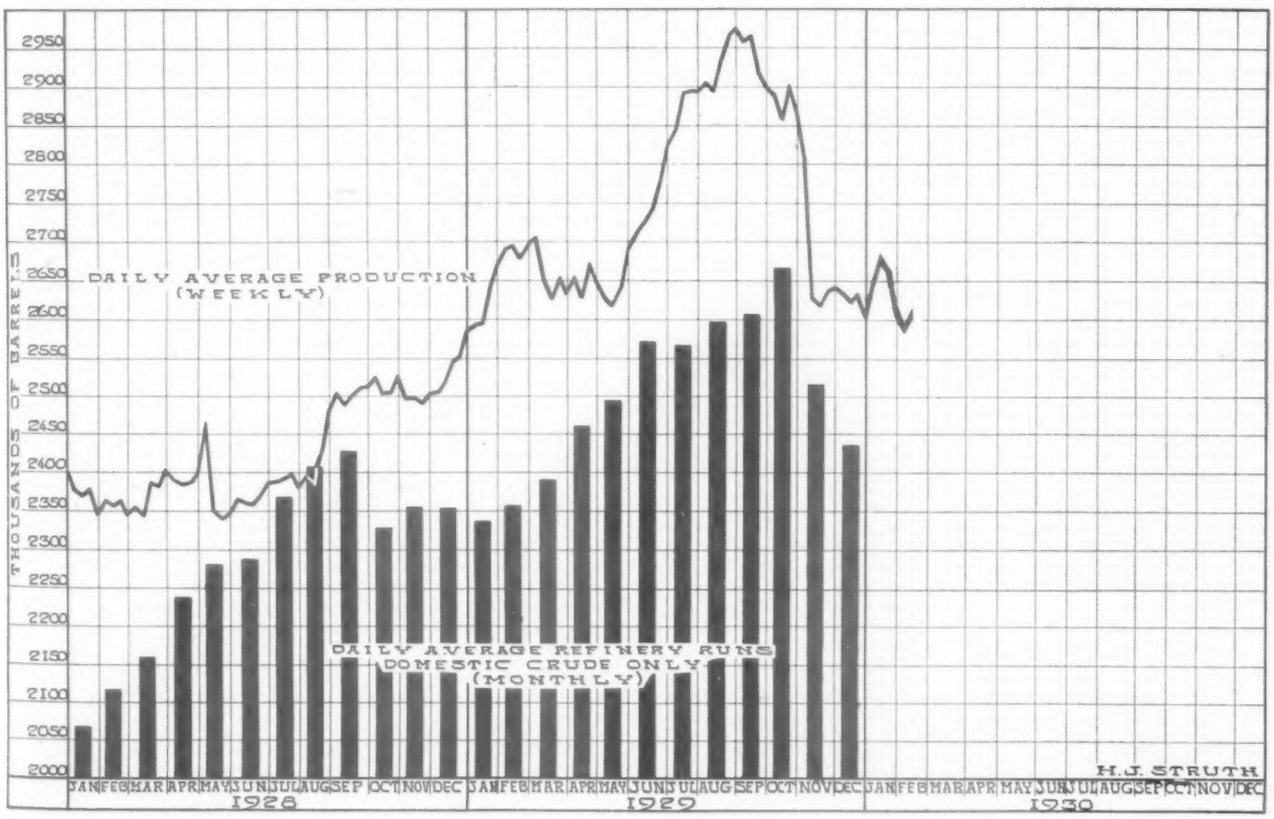
H. J. STRUTH, *Staff Economist, Houston, Texas*

Growing Excess Production Prompts Quick Action in Texas

GAINS recorded in Oklahoma's crude production last week were responsible for boosting the national daily average 18,800 barrels. Figures received from the American Petroleum Institute for the week ending February 8 reported a total daily average crude production of 2,613,800 barrels. Compared with revised data projecting the necessary production for the month of February, last week's daily average proved to be 236,712 barrels in excess of normal. On a cumulative basis, the total quantity of crude produced in the United States since January 1, aggregated 102,466,250 barrels, or 10,179,797 barrels in excess of the indicated normal demand. The revised figures, constituting normal, prescribe a limit for the United States during the month of February of 2,379,088 barrels daily, accentuating the need for further efforts to control the current supply.

Texas, particularly the Coastal area, continues to report gains in production. Last week, the total gain amounted to more than 5000 barrels for the state, while the Coastal area contributed more than 4000 barrels of that amount. This is rather surprising in view of the recent price reductions in Texas, but simply proves that new work under way is not side-tracked immediately following a downward revision in posted prices. It is encouraging to note, however, that the newly apointed committee, sponsored by operators at Fort Worth last month, is reported to be making splendid progress in getting operators together in various parts of the state in a concerted drive against overproduction. As indicated by the accompanying data, Texas is charged with being the most serious overproducer of crude. In fact, even at the increased rate of demand indicated for this month, this state, in combination with Louisiana and Arkansas, is overproducing to the extent of 144,328 barrels a day. Compared with other sections of the country, this undoubtedly calls for immediate action on

DOMESTIC PRODUCTION AND REFINERY RUNS



the part of operators. Since the allowable rate of production in Texas contemplates a further gain in imports of crude from South America, it is obvious that operators must not fail to keep production within the limits prescribed in order to realize better market prices for their oil. Regardless of what future action may be taken on the tariff issue, Texas operators must curtail production now or suffer the prospect of marketing their oil at low prices for many months to come. If Texas production is curtailed 144,000 barrels a day, immediately, operators will quickly realize that imported oil is not such an important factor in their situation after all. Then, too, the probable difference in market value of their oil will readily offset the difference in daily production.

How Last Week's Daily Average Crude Production Compares With Necessary Production for February, 1930

	Necessary Requirements* Month of Feb. (Daily Average)	Actual Prod. Week ending Feb.8 1930	Excess
Oklahoma-Kansas.	695,637	742,100	48,463
Texas, Arkansas & Louisiana	808,172	952,500	144,328
California	684,959	707,900	22,941
Balance of U. S.	190,320	211,300	20,980
Total	2,379,088	2,613,800	236,712

Cumulative Total Production

	Necessary Production To Feb 8	Actual Production To Feb. 8	Excess
United States	92,286,453	102,466,250	10,179,797

*Based upon potential demand less imports.

Oklahoma Gains

Oklahoma reported a gain in daily average production last week which amounted to 19,650 barrels. A large part of this gain was reported from the Oklahoma City and Earlsboro pools. On the whole, conditions in Oklahoma and Kansas are considered good and there is every liklihood of continued cooperation in the movement to control output. Last week, production of both Oklahoma and Kansas apparently only exceeded indicated demand by 48,463 barrels a day. This is not considered in the light of serious overproduction, particularly when succeeding weeks are likely to witness a series of sizeable declines in production.

California Lower

California production was again slightly lower last week, declining 2700 barrels, which was due to a decline of 4700 barrels at Santa Fe Springs. There are apparently still many difficulties to be straightened out in California, since it is noted that Long Beach, Elwood and Midway-Sunset are still producing crude above the allowable quantity. Last week, the Long Beach field recorded a gain of 2500 barrels daily, partly offsetting the favorable decline reported from Santa Fe Springs.

Executives of leading oil companies have taken the bull by the horns in a last-minute effort to save the industry in California from further disorder, the avowed intention being to reduce production to 609,000 barrels during the remainder of 1930. After a series of meetings, several operators who have been lukewarm in their support of the curtailment program have announced that they will make further reductions.

Immediately after February 1, conditions became worse. It became increasingly difficult to hold production down, while crude oil was being released both from storage and through field lines to sources which made for a still weaker gasoline market. With several holdouts at Santa Fe Springs and a tendency to scheme for a larger output, conditions in this field were far from ideal.

Every flush field in the state will be affected by the general curtailment plan. A six-day, wide-open test will be given to establish absolute potentials. This test is being made in the Elwood and Ventura fields and if favorable action is taken at the Long Beach and Santa Fe Springs meetings, new potentials will also be established in these areas. Maricopa Flats, Kern Front, Round Mountain and Mt. Poso will be included in the curtailment plan, with the possibility that every flush and semi-flush field in the state will be affected.

American Petroleum Institute estimates of needs for 1930 were used as a basis for arriving at the allowable of 609,000 barrels. The breakdown by fields has not been worked out. Santa Fe Springs probably will not be reduced to a figure below 150,000 barrels, while Long Beach may remain at 100,000 barrels. If these figures are designated, it will be necessary to stay within these limits, however.

A committee of 15 practical oil men has been formed to work out the details of the new curtailment plan.

It is believed that if favorable action is not taken, both crude and refined prices will tumble at once. There is little storage room available and continued overproduction simply can not be tolerated. Tanks suitable for storing gasoline are very scarce and increases in refinery runs will play havoc.

California's action will vitally affect the Mid-Continent. If restraint is thrown to the wind and production jumps 150,000 barrels, increased shipments of refined products and fuel oil to the Atlantic seaboard will weaken the market on both ends. California will be forced to dispose of its surplus products to any market that will absorb them. Shipments through the Panama Canal will be roughly proportional to the production in California. Successful inauguration of the proposed plan to reduce the output to 609,000 barrels will save both the Mid-Continent and California from much grief.

Efforts of Texas operators to fulfill their program of curtailing the daily output of the state about 100,000 barrels rests

CRUDE RUNS TO STILLS, GASOLINE AND GAS AND FUEL OIL STOCKS, WEEK ENDING FEBRUARY 8, 1930

(Figures in barrels of 42 gallons)

District—	Potential Daily Capacity	Potential Capacity Reporting Total	Potential Capacity Reporting Per Cent	Crude Runs to Stills Total	Crude Runs to Stills Daily Average	Crude Runs to Stills Per Cent Operated	Gasoline Stocks	Gas & Fuel Oil Stocks
East Coast	605,700	605,700	100.0	3,250,000	464,300	76.7	7,712,000	7,017,000
Appalachian	128,100	116,600	91.0	589,800	84,300	72.3	1,480,000	723,000
Indiana, Illinois, Kentucky	360,000	355,000	98.6	2,064,500	294,900	83.1	6,797,000	3,237,000
Oklahoma, Kansas, Missouri	462,200	408,700	88.4	1,822,400	260,300	63.7	4,390,000	3,021,000
Texas	778,000	702,700	90.3	3,796,000	542,300	77.2	8,162,000	12,416,000
Louisiana-Arkansas	270,600	262,000	96.8	1,276,800	182,400	69.6	2,425,000	4,221,000
Rocky Mountain	148,900	139,250	93.5	385,100	55,000	39.5	2,576,000	1,017,000
California	897,400	879,400	98.0	4,154,500	593,500	67.5	15,638,000	108,892,000
Total Week February 1	3,650,900	3,469,350	95.0	17,339,100	2,477,000	71.4	49,180,000	140,544,000
Total Week January 25	3,650,900	3,486,600	95.5	17,578,800	2,511,300	72.0	47,095,000	142,915,000
The Texas and Louisiana Gulf Coastal Figures Shown Below are Included Above in the Totals of Their Respective Districts:								
Texas Gulf Coast	526,500	523,500	99.4	3,013,200	430,500	82.2	7,084,000	9,644,000
Louisiana Gulf Coast	147,500	147,500	100.0	810,000	115,700	78.4	2,070,000	3,407,000

FIELD STATISTICS OF IMPORTANT DISTRICTS

Pool—	Oil Wells Completed	Total Initial Production	Initial Per Well	Number Producing Wells	Daily Production Barrels	Daily Prod. Per Well	Rigs Up	Wells Drilling
WEST TEXAS:								
Hendrick	621	3,117,155	5,028	564	88,245	156[1]	2	..
Church & Fields	213	214,630	1,011	206	22,255	108	2	4
Gulf-McElroy	84	61,905	742	82	14,375	175	1	1
Yates	366	2,502,795	6,901	355	133,800	377[1]	9	8
TEXAS PANHANDLE:								
Gray County	546	395,850	725	520	56,075	108[1]	8	51
CALIFORNIA:								
Santa Fe Springs[2]	496	1,581,000	3,187	196	164,000	836	12	165

[1]Production partially pinched.
[2]Includes deep zone production only. For field total add 60 wells and 3000 barrels.

in the hands of a general committee, but actual results are destined to be slow in materializing. The work of this committee was stimulated when a cut of 30,000 barrels in the Yates field was authorized by the operators, but since the field is being prorated under the rules of the Texas Railroad Commission the latter must give 10 days' notice and hold a formal hearing before the reduction can be effective. The hearing has been set for February 21, so the proposed cut in Yates will not be reflected in general production figures until early in March.

Teras Reduction Efforts

The task of the general committee of Texas operators is extremely difficult because of danger in running afoul anti-trust laws of the state, while operators as a whole are not giving hearty cooperation to the program.

Members of the committee spent Monday in Austin conferring with Governor Dan Moody and members of the legislature in an effort to obtain the support of the state authorities in amending the laws so that operators can proceed with their plans of curbing excessive production.

While this committee is laboring diligently for the general welfare of the producing branch of the oil industry, groups of operators in Gray County and Darst Creek field are violating the terms of their voluntary proration plans by producing far in excess of daily quotas.

Refined Products Slow

During the past week new oil producing areas were established by wildcatters in Carson, Cooke, Jack and Young Counties, while a large number of new locations were ordered drilled in Pecos, Ector and Williamson Counties within the same period.

The refined oil market is in a very unstable status in the interior refining centers of Texas, with trading slow on all commodities. Plant owners are enjoying a price advantage on crude supplies over their competitors in the upper section of the Mid-Continent district but are not cashing in on the unusual situation because buyers of motor fuels and burning oils are taking little interest in the market.

Plan Cut of California Refinery Runs

Los Angeles. — Coincident with the move to bring production in California down to 609,000 barrels, efforts are also being made to reduce refinery runs and to limit shipments to markets ordinarily dominated by other producing territories.

Santa Fe Springs operators have agreed to give the field a five-day, wide open test to determine the potential and to place the field on a basis which would help to bring the state total down to the proper figure. The test will start late this week, under the direction of the umpire. Long Beach operators have also gone on record as favoring more stringent curtailment measures.

This five-day test will start not later than Saturday to determine the actual potential. The test will be made in other flush fields affected by the new plan, as soon as possible.

An agreement is expected to be reached to reduce refinery runs more than 75,000 barrels, this step being necessary to stabilize the gasoline market. A technical and advisory committee of 15 has been appointed to study each field and to further ascertain the needs of the state.

IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

(Barrels of 42 gallons)

	Week Ended February 1		Week Ended January 25
AT ATLANTIC COAST PORTS—			
Baltimore	326,000		.....
Boston	.....		175,000
New York	477,000	A	1,288,000
Philadelphia	218,000		407,000
Others	345,000		327,000
Total	1,366,000		2,197,000
Daily Average	195,143		313,857
AT GULF COAST PORTS—			
Galveston District	65,000		.....
New Orleans and Baton Rouge	15,000		63,000
Port Arthur and Sabine District	.....		.....
Tampa	.....		.....
Total	80,000		63,000
Daily Average	11,428		9,000
AT ALL UNITE DSTATES PORTS—			
Total	1,446,000		2,260,000
Daily Average	206,571		322,857
Daily Average Four Weeks Ended	269,786		271,393

CALIFORNIA OIL RECEIPTS AT ATLANTIC AND GULF COAST PORTS

(Barrels of 42 gallons)

	Week Ended February 1		Week Ended January 25
AT ATLANTIC COAST PORTS—			
Baltimore	72,000		270,000
Boston	.....		60,000
New York	167,000		82,000
Philadelphia	80,000		253,000
Others	54,000		.....
Total	373,000		665,000
Daily Average	53,286		95,000
AT GULF COAST PORTS—			
Total	25,000	A	91,000
Daily Average	3,571		13,000
AT ATLANTIC AND GULF COAST PORTS—			
Total	398,000		756,000
Daily Average	56,857		108,000
Daily Average Four Weeks Ended	91,964		86,893
Distribution of Total California Oil Receipts is as Follows:			
Gasoline	398,000	A	626,000
Gas Oil	.....		130,000
Total	398,000		756,000

A—Revised.

NOT A SINGLE JOINT

HAS SHOWN A DEFECT DUE TO WORKMANSHIP OR MATERIAL

From a letter of Magnolia Gas Company, September 11, 1929, to Mr. L. R. Smith, President, A. O. Smith Corporation, Milwaukee, Wisconsin

"I want to take this opportunity of advising you that the two hundred and thirty odd miles of twelve, fourteen, eighteen, and twenty inch Smith-weld pipe furnished by you for the building of the gas main line from Bruni, Webb County, Texas, to San Antonio and New Braunfels was as fine a lot of pipe as I have ever seen laid.

"The use of the bell and spigot and the expansion joint made possible the highest type of high pressure gas pipe line construction. The speed maintained in welding the joints in the field by the Smith Electric process enabled us to finish the welding much sooner than we had anticipated.

"The line was tested under high pressure. Several sections of it were closed in, and, over a ten-day period, did not show as much as a half pound drop, with temperature corrections; and not a single joint has shown a defect due to workmanship or material.

Yours very truly,
(Signed) Fred M. Lege, Jr.,
President."

A. O. SMITH CORPORATION
General Offices: Milwaukee, Wis.
Oil & Gas Field Products Division
District Offices at:
New York Tulsa Houston Los Angeles

SMITH *WELDED* GAS LINE PIPE

United States Daily Average Production

Figures below are taken from the complete revised estimates of the AMERICAN PETROLEUM INSTITUTE except for the current week, which are advance estimates issued by the A. P. I. and are subject to revision:

1929	Oklahoma	Kansas	Texas (Outside Gulf Coast)	Gulf Coast	North Louisiana	Arkansas	Eastern States	Rocky Mountain	California	United States Daily Av.	United States Total
January	722,550	97,150	632,500	136,750	36,650	78,600	111,950	73,200	747,250	2,635,600	81,703,600
February	714,800	95,950	643,350	142,300	35,700	74,600	108,550	71,750	797,800	2,684,800	75,204,400
March	666,500	95,500	662,500	147,750	35,800	74,250	108,850	70,400	786,000	2,647,400	82,068,350
April	665,600	106,400	650,100	154,550	35,550	72,900	110,850	69,400	781,350	2,646,700	79,402,100
May	679,650	115,400	651,100	150,350	35,350	71,500	114,150	72,850	749,250	2,639,600	81,827,600
June	685,200	120,750	688,200	147,500	35,700	70,050	116,750	72,000	827,200	2,763,400	82,902,250
July	722,050	124,250	718,950	148,150	35,750	68,650	122,000	74,250	874,850	2,888,900	89,555,250
August	728,100	127,950	750,750	153,100	36,300	66,900	126,600	77,900	873,300	2,940,900	91,167,250
September	714,050	128,450	741,200	156,600	37,050	65,300	137,250	78,600	874,850	2,933,350	88,000,650
October	673,600	113,400	714,550	167,050	39,700	64,550	137,400	77,950	876,600	2,864,800	88,809,500
November	640,300	110,050	702,350	171,350	36,750	63,700	135,400	76,550	706,500	2,642,800	79,285,050
December	650,000	111,600	687,850	161,350	38,700	61,850	140,650	76,150	698,200	2,626,350	81,417,000
1930											
January	671,050	111,700	672,650	178,300	37,650	58,500	142,250	73,850	688,850	2,634,800	81,574,650
Feb. 1	612,000	110,400	655,900	195,050	36,500	57,250	138,650	78,650	710,600	2,595,000	18,165,000
Feb. 8	631,650	110,450	656,700	199,500	37,600	58,700	137,000	74,300	707,900	2,613,800	18,296,600
Increase	19,650	50	800	4,450	1,100	1,450	.....	.....	.....	18,800	131,600
Decrease	.....	.....	.....	.....	.....	.....	1,650	4,350	2,700	.....	.....

TEXAS
(Outside Gulf Coast)
PANHANDLE DISTRICT

	Feb. 8	Feb. 1
Carson County	9,400	8,750
Gray County	56,300	54,900
Hutchinson County	24,800	23,000
Wheeler County	800	550
Others	500	600
Total	91,800	87,800

NORTH TEXAS

Archer County	17,800	17,600
Burkburnett	8,200	8,200
Electra	11,500	11,550
Iowa Park-KMA	5,200	5,100
Montague and Cooke Cos.	11,550	11,200
Wilbarger	26,100	25,900
Others	1,500	1,500
Total	81,850	81,050

WEST CENTRAL TEXAS

Brown County	8,900	9,600
Callahan County	3,600	3,500
Coleman County	5,600	6,700
Eastland-Desdemona	6,050	6,100
Jack County	4,600	4,500
Palo Pinto County	600	550
Shackelford County	9,000	9,300
Stephens County	5,300	5,500
Throckmorton County	700	600
Young County	8,100	7,800
Others	1,400	1,800
Total	53,853	55,950

WEST TEXAS

Crane-Upton Counties	45,850	45,350
Crockett County	2,050	2,100
Howard County	38,350	39,300
Jones County	2,300	2,200
Mitchell-Scurry Cos.	2,450	2,300
Yates	130,650	134,300
Balance Pecos County	7,200	7,600
Reagan County	17,050	16,500
Winkler County	88,600	89,800
Others	3,800	3,350
Total	338,300	342,800

EAST CENTRAL TEXAS

Boggy Creek	3,700	3,900
Corsicana-Powell	5,850	6,000
Currie	400	400
Mexia	4,700	4,750
Nigger Creek	250	250
Richland	250	250
Wortham	900	900
Van Zandt	6,800	4,800
Total	22,850	21,250

SOUTHWEST TEXAS

Dale	300	300
Laredo District	8,700	8,850
Luling	10,500	10,400
Lytton Springs	900	900
Somerset	1,500	1,500
Salt Flat	27,900	27,500
Darst Creek	15,500	15,000
Others	2,750	2,600
Total	68,050	67,050
T'tl Tex. (outside Gulf Coast)	656,700	655,900

TEXAS GULF COAST

Barbers Hill	25,650	23,900
Batson	1,100	1,100
Big Creek	4,500	4,300
Blue Ridge	1,950	1,850
Boling	1,000	1,000
Damon Mound	500	500
Goose Creek	4,800	4,750
Hull	9,100	10,500
Humble	16,400	14,600
Orange County	2,600	2,550
Pierce Junction	11,100	12,350
Raccoon Bend	12,050	12,000
Refugio	30,400	26,600
Saratoga	1,000	1,000
Sour Lake	2,450	2,450
South Liberty	6,450	7,150
Spindle Top	19,100	19,500
Sugar Land	12,100	11,900
West Columbia	6,000	6,100
Washington Co.	1,650	1,600
Fannett	1,400	1,500
Port Neches	1,600	1,900
North Dayton	1,200	1,200
Others	4,300	3,700
Total	178,400	174,000
Texas Total	835,100	829,900

OKLAHOMA

Asher	2,200	2,250
Carr City	7,950	7,150
Logan County	13,100	13,950
Braman	3,600	3,600
Blackwell	3,400	3,400
Hubbard	1,650	1,650
Thomas	550	550
Tonkawa	8,500	8,500
Garber	4,550	4,600
Burbank	16,500	16,900
Osage (outside Burbank)	26,400	26,450
Cushing	14,250	14,250
Yale Jennings	8,650	8,600
Davenport	1,250	1,250
Bristow Slick	17,500	17,550
North Okmulgee	11,300	11,300
Lyons Deaner	6,300	6,300
Cromwell	7,300	7,250
Papoose	2,900	2,900
Wewoka	4,150	4,200
Seminole	22,150	23,100
East Seminole	3,700	4,750
Bowlegs	21,050	22,200
Searight	7,400	7,200
Little River	44,850	44,600
East Little River	20,550	19,900
Earlsboro	30,050	28,100
East Earlsboro	53,250	40,050
Duncan District	8,450	8,400
Graham	3,700	3,750
Fox	1,300	1,250
Healdton	12,250	12,200
Hewitt	7,400	7,400
Scholem Alechem	14,000	14,000
Pearson	800	750
St. Louis	41,300	42,150
Allen	23,450	23,800
Maud	6,000	6,550
Mission	12,800	14,400
Oklahoma City	69,650	57,150
Sasakwa	10,350	12,500
Others	55,200	55,200
Total	631,650	612,000

CALIFORNIA

Santa Fe Springs	162,500	167,200
Long Beach	109,000	106,500
Huntington Beach	41,000	41,000
Dominguez	10,500	10,000
Inglewood	22,500	22,500
Midway-Sunset	75,000	75,000
Ventura Avenue	51,100	51,400
Seal Beach	29,500	29,500
Elwood-Goleta	33,800	34,500
Kettleman Hills	14,000	14,000
Others	159,000	159,000
Total	707,900	710,600

KANSAS

Greenwood County	20,600	20,800
Florence-Covert	900	900
Peabody-Ebling	3,050	3,000
Eldorado-Towanda	13,150	13,150
Augusta-Fox Bush	2,900	2,950
Rainbow Bend	1,100	1,100
Russell	3,400	3,400
Churchill	4,250	4,300
Oxford	3,150	3,150
Sedgwick	23,450	23,150
Others	34,500	34,500
Total	110,450	110,400

NORTH LOUISIANA

	Feb. 8	Feb. 1
Homer	3,600	3,600
Haynesville	4,600	4,600
Caddo Light	9,550	8,900
Caddo Heavy	2,950	2,650
DeSoto-Red River	2,350	2,350
Elm Grove	450	450
Bellevue	600	650
Cotton Valley	2,100	2,200
Urania	5,150	5,150
Pleasant Hill	900	900
Zwolle	4,000	4,050
Others	1,350	1,000
Total North Louisiana	37,600	36,500

LOUISIANA GULF COAST

Bayou Boullion	50	50
East Hackberry	1,400	1,500
Hackberry	1,700	1,300
Edgerly	600	800
Evangeline	1,200	900
Lockport	2,950	3,150
Sorrento	100	100
Sulphur Dome	5,300	5,100
Vinton	3,900	3,800
Others	3,900	4,350
Total Louisiana Gulf Coast	21,100	21,050
Louisiana Total	58,700	57,550

ARKANSAS

El Dorado	4,050	4,200
Champagnolle	4,950	4,850
Smackover Light	5,200	5,250
Smackover Heavy	41,100	39,550
Stephens	1,000	1,000
Nevada	1,100	1,100
Lisbon	1,050	1,050
Others	250	250
Total	58,700	57,250

MOUNTAIN STATES
WYOMING

Salt Creek	29,200	33,550
Grass Creek	2,000	1,900
Elk Basin	750	800
Big Muddy	2,000	2,000
Lost Soldier	3,300	3,250
Rock River	2,400	2,300
Lance Creek	200	200
Oregon Basin	3,850	3,850
La Barge	2,350	2,350
Others	3,600	3,800
Total	49,650	54,000

MONTANA

Cat Creek	1,200	1,150
Sunburst	5,950	5,950
Pondera	2,100	2,150
Others	50	100
Total	9,300	9,350

COLORADO

Moffats (Craig)	1,100	1,000
Fort Collins	1,800	1,800
Florence	500	400
Others	1,650	1,700
Total	5,050	4,900

NEW MEXICO

Table Mesa	100	100
Artesia	750	750
Hogback	400	400
Rattlesnake	1,100	550
Bal. Lea and Eddy Cos.	7,000	7,650
Others	950	950
Total	10,300	10,400
Total Mountain States	74,300	78,650

EASTERN STATES

(Including Ill., Ind., Ohio, W. Va., Pa., Ky., N. Y. & Mich.)	137,000	138,650

PRODUCTION SUMMARY

East of Rockies	1,831,600	1,805,750
Total U. S.	2,613,800	2,595,000

CRUDE OIL PRICE QUOTATIONS

(Revised to February 11, 1930)

EASTERN STATES

(Effective November 12, 1929)

Penna Grade Oil in New York Transit Lines (New York)	$3.05
Bradford District Oil in National Transit Lines (Pennsylvania)	3.05
Penn Grade Oil in National Transit Lines (Pennsylvania)	3.05
Penn Grade Oil in Southwest Pennsylvania Lines (Penna.)	3.00
Penn Grade Oil in Eureka Pipe Line Lines (West Virginia)	2.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	2.70
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia)	1.75
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s lines	1.80
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines	1.90
Somerset Oil in Cumberland Pipe Line lines (Kentucky)	1.55
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (Effective Jan. 29, 1929)	60
Keister (Pennsylvania)	1.20

CENTRAL STATES

(Effective May 21, 1929)

Posted by Ohio Oil Co.

Illinois	$1.75
Indiana	1.57
Lima	1.80
Plymouth	1.28
Princeton	1.75
Waterloo	1.35
Wooster	1.90

WESTERN KENTUCKY

All grades	1.68

MID-CONTINENT

(Effective January 31, 1930)

Carter Oil Company and Magnolia Petroleum Company

Below 25 gravity	$ .60
25 to 25.9 gravity	.66
26 to 26.9 gravity	.72
27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 and above	1.44

From 33 to 44 gravity and above, Magnolia Petroleum Company prices are the same as those of Carter Oil Company.

MID-CONTINENT

(Effective May 20, 1929)

Gulf Pipe Line Company, Sinclair Pipe Line Company, Prairie Oil and Gas Company and The Texas Company

25 to 25.9 gravity	.90
26 to 26.9 gravity	.95
27 to 27.9 gravity	1.00
28 to 28.9 gravity	1.05
29 to 29.9 gravity	1.10
30 to 30.9 gravity	1.15
31 to 31.9 gravity	1.20
32 to 32.9 gravity	1.25
33 to 33.0 gravity	1.30
34 to 34.9 gravity	1.35
35 to 35.9 gravity	1.40
36 to 36.9 gravity	1.45
37 to 37.9 gravity	1.50
38 to 38.9 gravity	1.55
39 to 39.9 gravity	1.60
40 to 40.9 gravity	1.65
41 to 41.9 gravity	1.70
42 to 42.9 gravity	1.75
43 to 43.9 gravity	1.80
44 and above	1.85

PANHANDLE

(Effective Jan. 15, 1930)

GRAY COUNTY

(Humble Oil & Refining Company, Magnolia Petroleum Company, Gulf Pipe Line Company)

Below 29 gravity	$ .69
29 to 29.9 gravity	.75
30 to 30.9 gravity	.81
31 to 31.9 gravity	.87
32 to 32.9 gravity	.93
33 to 33.9 gravity	.96
34 to 34.9 gravity	.99
35 to 35.9 gravity	1.02
36 to 36.9 gravity	1.05
37 to 37.9 gravity	1.08
38 to 38.9 gravity	1.11
39 to 39.9 gravity	1.14
40 to 40.9 gravity	1.17
41 to 41.9 gravity	1.20
42 to 42.9 gravity	1.23
43 to 43.9 gravity	1.26
44 and above	1.29

WHEELER COUNTY

(Humble Oil and Refining Company and Magnolia Petroleum Company)

Below 30 gravity	$ .70
30 to 30.9 gravity	.76
31 to 31.9 gravity	.82
32 to 32.9 gravity	.88
33 to 33.9 gravity	.91
34 to 34.9 gravity	.94
35 to 35.9 gravity	.97
36 to 36.9 gravity	1.00
37 to 37.9 gravity	1.03
38 to 38.9 gravity	1.06
39 to 39.9 gravity	1.09
40 to 40.9 gravity	1.12
41 to 41.9 gravity	1.15
42 to 42.9 gravity	1.18
43 to 43.9 gravity	1.21
44 and above	1.24

CARSON-HUTCHINSON COUNTIES

(Humble Oil and Refining Company, Magnolia Petroleum Company and Gulf Pipe Line Company)

Below 32 gravity	$ .72
32 to 32.9 gravity	.78
33 to 33.9 gravity	.81
34 to 34.9 gravity	.84
35 to 35.9 gravity	.87
36 to 36.9 gravity	.90
37 to 37.9 gravity	.93

CALIFORNIA CRUDE OIL PRICES AT THE WELL

(EFFECTIVE NOVEMBER 8, 1929)

Following are the current prices offered by Standard Oil Company for crude oil at the well: (Price per barrel of 42 gallons in fields indicated)

Gravity	Ventura*	Signal Hill	Alamitos Heights-Seal Beach	Huntington Beach	Inglewood	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood† Terrace	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway-Sunset Elks Hills	Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$ .85	$ .70	$ .70	$ .70	$ .70	$ .70	$ ..	$ ..	$ .70	$ .70	$ .70	$ .70	$ .70	$ ..	$ .50	$ .50	$ .50	$ .50	$ .50	$ .50
15-15.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
16-16.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
17-17.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
18-18.9	.85	.75	.75	.75	.75	.75	..	..	.75	.75	.75	.70	.75	..	.50	.56	.56	.56	.56	.56
19-19.9	.85	.80	.80	.80	.80	.80	..	..	.80	.80	.80	.75	.80	..	.50	.62	.62	.62	.62	.62
20-20.9	.85	.85	.85	.85	.85	.85	..	..	.85	.85	.84	.80	.84	..	..	.68	.68	.68	.68	.68
21-21.9	.86	.89	.89	.89	.89	.89	..	..	.89	.89	.88	.85	.88	.89	..	.74	.74	.74	.74	.74
22-22.9	.87	.93	.93	.93	.93	.93	..	..	.93	.93	.91	.90	.91	.92	..	.80	.80	.80	.80	.80
23-23.9	.90	.97	.97	.97	.97	.97	..	..	.97	.97	..	.95	.94	.95	..	.85	.85	.85	.85	.85
24-24.9	.94	1.01	1.01	1.01	1.01	1.01	1.01	..	1.01	1.01	..	.98	.97	.98	..	.90	.90	.90	.88	.88
25-25.9	.98	1.05	1.05	1.05	1.05	1.05	1.05	..	1.05	1.05	..	1.01	1.00	1.01	..	.95	.95	.95	.91	.91
26-26.9	1.02	1.09	1.09	1.09	1.09	1.09	1.09	..	1.09	1.09	..	1.04	1.04	1.04	..	1.00	1.00	1.00	.94	.94
27-27.9	1.06	1.13	1.13	1.13	1.13	1.13	1.13	..	1.13	1.13	..	1.07	1.08	1.07	..	1.05	1.05	1.05	.98	.97
28-28.9	1.10	1.17	1.17	1.17	1.17	1.17	1.17	..	1.17	1.17	..	1.10	1.12	1.10	..	1.10	1.10	1.10	1.02	..
29-29.9	1.14	1.21	1.21	1.21	..	1.21	1.21	..	..	1.21	..	1.13	1.16	1.15	..	1.16	1.16	1.16	1.06	..
30-30.9	1.18	1.25	1.25	1.25	..	1.25	1.25	..	..	1.25	..	1.16	1.20	1.20	..	1.22	1.22	1.22	1.10	..
31-31.9	1.23	1.30	1.30	1.30	..	..	1.30	..	..	..	..	..	..	1.25	..	1.28	1.28	1.28	1.14	..
32-32.9	1.28	1.35	1.35	1.35	..	..	1.35	..	..	..	..	..	..	1.30	..	1.34	1.34	1.34	1.18	..
33-33.9	..	..	..	..	..	..	1.41	..	..	..	..	..	..	1.35	..	1.40	1.40	1.40	1.22	..
34-34.9	..	..	..	..	..	..	1.47	1.16	..	..	..	..	..	1.40	..	..	..	1.46	1.26	..
35-35.9	..	..	..	..	..	..	1.53	1.22	..	..	..	..	..	1.45	..	..	..	..	1.30	..
36-36.9	..	..	..	..	..	..	1.59	1.28	..	..	..	..	..	1.50	..	..	..	..	..	..
37-37.9	..	..	..	..	..	..	1.65	1.34	..	..	..	..	..	1.55	..	..	..	..	..	..
38-38.9	..	..	..	..	..	..	1.71	1.40	..	..	..	..	..	1.60	..	..	..	..	..	..
39-39.9	..	..	..	..	..	..	1.77	1.46	..	..	..	..	..	1.65	..	..	..	..	..	..
40-40.9	..	..	..	..	..	..	1.83	1.52	..	..	..	..	..	..	..	..	..	..	..	..
41-41.9	..	..	..	..	..	..	1.89	1.58	..	..	..	..	..	..	..	..	..	..	..	..
42-42.9	..	..	..	..	..	..	1.95	1.64	..	..	..	..	..	..	..	..	..	..	..	..

KETTLEMAN HILLS—55 degrees Gravity and above $1.65 per barrel. *Union Oil Company. †Changed March 18, 1929.

(See Page 60)

NATIONAL ADVERTISING

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The more Sunlight, the better the Hay . . . and, certainly, the more the sun of advertising is turned on the products you carry, the better will be your business!

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is **NATIONALLY ADVERTISED AS THE** *Extra Service* **MOTOR OIL**

CRUDE OIL PRICE QUOTATIONS (*Continued from Page 58*)

38 to 38.9 gravity	.96
39 to 39.9 gravity	.99
40 to 40.9 gravity	1.02
41 to 41.9 gravity	1.05
42 to 42.9 gravity	1.08
43 to 43.9 gravity	1.11
44 and above	1.14

SOMERSET
Grayburg

Below 33 gravity	$1.05
33 to 33.9 gravity	1.07
34 to 34.9 gravity	1.09
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.13
37 to 37.9 gravity	1.15
38 and above	1.17

WEST TEXAS
Humble, Gulf, Magnolia and Southern Crude Oil Purchasing Company
(Effective Jan. 15, 1930)

Crane-Upton, Crockett, Howard, Pecos and Winkler Counties and Lea County, N. Mex.

Below 25 gravity	$ .55
25 to 25.9 gravity	.58
26 to 26.9 gravity	.61
27 to 27.9 gravity	.64
28 to 28.9 gravity	.67
29 to 29.9 gravity	.70
30 to 30.9 gravity	.73
31 to 31.9 gravity	.76
32 to 32.9 gravity	.79
33 to 33.9 gravity	.82
34 to 34.9 gravity	.85
35 to 35.9 gravity	.88
36 and above	.91

Magnolia posts in Crane, Upton and Winkler Counties. Southern Crude Oil Purchasing Company posts only in Crane, Upton and Winkler Counties.

HOWARD AND GLASSCOCK COUNTY CRUDE
(Effective Jan. 15. 1930)

Below 25 gravity	$ .55
25 to 25.9 gravity	.58
26 to 26.9 gravity	.61
27 to 27.9 gravity	.64
28 to 28.9 gravity	.66
29 to 29.9 gravity	.68
30 to 30.9 gravity	.70
31 to 31.9 gravity	.72
32 to 32.9 gravity	.74
33 to 33.9 gravity	.76
34 to 34.9 gravity	.78
35 to 35.9 gravity	.80
36 and above	.82

MARKHAM
The Texas Company
(Effective Jan. 15, 1930)

All grades	$ .75

CORSICANA HEAVY AND LULING

All grades	$ .75

SALT FLAT AND DARST CREEK

All grades	$1.05

NORTH AND CENTRAL TEXAS
(Effective Jan. 15, 1930)

Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran, Nocona and Lytton Springs Crude

(Humble Oil and Refining Company)

Below 25 gravity	$ .60
25 to 25.29 gravity	.66
26 to 26.9 gravity	.72
27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23

CLASSIFICATIONS OF GULF COAST CRUDE

The Texas Company: GRADE A—Beaume gravity not over 26.0 degrees at 60 degrees Fahrenheit; sulphur not over 0.5 per cent; in distilling 500 cc. of the crude that part of the distillate cut between 65 per cent off and 85 per cent off shall have a pour test of zero or lower. GRADE B—All Gulf Coast heavy crudes which do not meet tests for Grade "A" or for Gulf Coast light.

Humble Oil & Refining Company: GRADE A—All crude conforming to the following tests: viscosity not less than 100 seconds Saybolt at 100 degrees Fahrenheit; sulphur not over .4 per cent; Beaume gravity not over 25 at 60 degrees Fahrenheit. Cold tests of distillates having a viscosity of 1000 seconds at 100 degrees Fahrenheit shall not be over 5 degrees Fahrenheit. GRADE B—Embraces all Coastal crude which does not meet the tests for "A" grade crude.

Gulf Pipe Line Company: GRADE A—Beaume gravity not over 24 at 60 degrees Fahrenheit; viscosity not less than 100 seconds universal Saybolt at 100 degrees Fahrenheit; and sulphur not over 0.4 per cent. The yield of 250 viscosity reduced distillate at 100 degrees Fahrenheit not less than 30 per cent, and this 30 per cent not heavier than 20 Beaume, and its pour test not above zero Fahrenheit. The reduced distillate to be secured by reducing the crude with fire and steam until the bottoms have a flash of not less than 540 degrees Fahrenheit, and not more than 560 degrees Fahrenheit open cup, and the entire distillate obtained n this way reduced to a distillate of 250 viscosity. The 10 per cent cut in the original distillate having an average viscosity of 500 seconds at 100 degrees Fahrenheit to have a pour test not higher than 5 degrees Fahrenheit. GRADE B—Embraces crude which does not meet test for "A" grade.

Sun Pipe Line Company: GRADE A—Viscosity not less than 100 seconds at 100 degrees Fahrenheit Saybolt. Sulphur not over .4 per cent. Beaume gravity not over 25 at 60 degrees Fahrenheit. Cold Test: of distillates having viscosity of 1000 seconds at 100 degrees Fahrenheit shall not be over 5 degrees Fahrenheit A. S. T. M. Method. GRADE B—All Coastal crudes which do not meet specifications for Grade A crude.

38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 and above	1.44

SOUTH TEXAS

Mirando	$ .75

GULF COAST
(Effective May 21, 1929)

Grade "A" all companies	1.05

Grade "B"

Below 25 gravity	$ .90
25 to 25.9 gravity	.93
26 to 26.9 gravity	.96
27 to 27.9 gravity	.99
28 to 28.9 gravity	1.02
29 to 29.9 gravity	1.05
30 to 30.9 gravity	1.08
31 to 31.9 gravity	1.11
32 to 32.9 gravity	1.14
33 to 33.9 gravity	1.17
34 to 34.9 gravity	1.20
35 and above	1.23

WYOMING-MONTANA
(Effective May 21, 1929)

Wyoming

Byron	$1.33
Ferris	1.60
Elk Basin	1.65
Grass Creek	1.65
Rock Creek	1.40
Lost Soldier	1.05
Lance Creek	1.68
Mule Creek	1.20
Notches	.65
Big Muddy	1.43
Osage	1.65
Hamilton Dome	.85
Pilot Butte	1.75
Torchlight-Greybull	1.65
Lander	.80
Rex Lake	1.10
South Casper Creek-Poison Spider	1.00

SALT CREEK
Midwest Refining Company

29 to 29.9 gravity	$ .90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 and above	1.23

MONTANA
(Effective May 24)

Sunburst	$1.75
Cat Creek	1.48
Lake Basin	2.20

NEW MEXICO

Artesia	1.08
Hog Back	1.43

CANADA
(Effective May 21, 1929)

Oil Springs	$2.27
Petrolia	2.20

LOUISIANA-ARKANSAS
(Effective Jan. 16, 1930)

Homer, Haynesville, Caddo, El Dorado, De Soto and Crichton and Cotton Valley*
(Atlantic Oil Producing Company, Standard of Louisiana, Magnolia Petroleum Company and The Texas Company.)

27 to 27.9 gravity	$ .78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 gravity and above	1.44

*Shreveport-Eldorado's postings stop at above 40 gravity.

The posting on Cotton Valley is same as Caddo. From 36 to 52 and above the regular gravity schedule is followed.

The Texas Company pays North Texas gravity scale in North Louisiana.

STEPHENS
(All Companies)

Below 28 gravity	$ .70
28 to 28.9 gravity	.75
29 to 29.9 gravity	.80
30 to 30.9 gravity	.85
31 to 31.9 gravity	.90
32 gravity and above	.95

SMACKOVER
(All Companies)

Below 24 gravity	$ .85
24 and above	1.00
Bellevue	1.05
Jennings	1.15
Vinton	1.30
Edgerly	1.30
Starks Dome	1.30
Urania	.85
Calion	.75

NEW LINES CONTEMPLATED?

Investigate the new Hill, Hubbell & Company process of mechanically coating and wrapping pipe *at the mill.* Biturine Coatings are particularly adapted for use with this process.

Once the pipe is in the ground

Pipe is expensive. Pipe laying is a costly operation. But the taking up and reconditioning of old pipe lines—laid without the proper protection—is the most expensive operation of all.

Inter-State Gas Company Line from Monroe, La., to Natchez, Miss., Coated Outside with Biturine Enamel

From the instant that unprotected pipe has been lowered into the ground, corrosion starts its attack and begins to levy its appalling toll.

You can protect your pipe line investment *before* corrosion sets in. For twenty-three years this organization has been developing a group of protective coatings to meet the specialized needs of the oil industry.

Biturine Coatings have earned the respect and enthusiastic endorsement of pipe line operators and their engineering staffs, for Biturine has met the exacting requirements of rigid competitive tests and is today demonstrating its superiority in thousands of miles of pipe lines.

We will be glad to furnish you with records of service of Biturine coated lines upon receipt of your inquiry at any of the offices listed below.

BITURINE COATINGS

Biturine Enamel Primer* Biturine Coupling Solution
Biturine 70-30 Biturine Enamel Biturine Solution No. 5
Biturine Enamel Primer can be obtained with Inhiburine.

*INHIBURINE

This entirely new inhibitor with extraordinary anti-corrosive powers is now being incorporated into Biturine Primer whenever specified. Being solvent in Bitumens it becomes an integral part of the priming coat and functions as a second line of defense against corrosion should the Biturine Enamel Coating be penetrated.

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HILL, HUBBELL & COMPANY DIVISION

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LOS ANGELES PORTLAND SEATTLE SPOKANE

Moore WALKING BEAM

AS GOOD AS THE CHAMPION DERRICK

A heavy, rolled steel girder section forms the basis of Moore Walking Beam strength. It has electrically welded web and flange stiffeners at nose, tail, saddle and intermediate points. The cast steel temper screw bearing support is secured to the beam by both rivets and electric welding. Removable temper screw bearings ordinarily furnished are of babbitted cast iron. Hard wood bearings can be supplied.

There are beams for pumping or cable drilling. Of special interest is the underslung type for pumping service, which is pictured above. With this design the deflection of the polish rod is very slight and even the longer stroke wells can be pumped without special rod hangers. The cable drilling beam has the temper screw bearing on top instead of being underslung.

Moore

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DALLAS, TEXAS WICHITA, KANSAS CASPER, WYO.

SHREVEPORT, LA. HOUSTON, TEXAS

Stocks in All Principal Fields

PERSONAL MENTION-MEN YOU KNOW

W. G. Skelly, president of Skelly Oil Company, has returned to Tulsa from New York.

W. S. Fitzpatrick, chairman of the board of Prairie Oil & Gas Company, was in Washington last week.

Elbert E. Boylan has assumed duties as general manager of the Caracas Petroleum Corporation in Venezuela.

E. B. Reeser, president of Barnsdall Corporation and of the American Petroleum Institute, has returned from the east to Tulsa.

M. W. Lake has been promoted to superintendent of the Midway-Sunset fields for Richfield Oil Company, replacing L. S. Cox who recently resigned.

J. H. McEvoy, Jr., president of J. H. McEvoy & Company of Houston, recently arrived in Los Angeles by airplane and will spend several days in California. He was accompanied by Mrs. McEvoy.

C. O. Harper has been named superintendent of production for Richfield Oil Company at Long Beach, Huntington Beach and Potrero, replacing H. A. Brand who resigned.

John R. Dallerup, manager of the Los Angeles plant of the Reed Roller Bit Company, accompanied S. P. Farish, president of the company, to Houston at the conclusion of the latter's visit to Los Angeles.

R. S. Gray, known better throughout the Mid-Continent oil areas, as Uncle Dick is seriously ill at his home in Tulsa. Mr. Gray is assistant superintendent of the land department of Prairie Oil & Gas Company.

W. Earle Pashley, advertising manager of the C. F. Pease Company, 813 North Franklin Street, Chicago, has been appointed assistant sales manager and second vice-president and elected to the board of directors. He will continue to be in charge of the company's advertising.

Eli R. Cunningham of the United Gas Company, with headquarters in the general offices at Houston, has been promoted from assistant superintendent of operations to superintendent of operations, which contemplates the general superintendency of the Dixie Gulf Gas Company and Houston Gulf Gas Company, both subsidiaries of United Gas Company.

J. G. Benedict, general manager of the Landis Machine Company, Waynesboro, Pennsylvania, and C. N. Kirkpatrick, general sales manager, sailed for Europe on Friday, January 31. They expect to spend approximately two months in England and on the Continent, securing first hand information concerning European conditions.

Clyde Ellwood, vice-president of the Axelson Manufacturing Company, recently addressed the "California School of the Air," over the Pacific Coast network of the National Broadcasting Company. He told the large audience of student listeners of the possibilities existing in the petroleum industry for those expecting to enter it in technical or other capacities.

O. E. Hanson, resident engineer of the United States Geological Survey, has been transferred from Roswell, New Mexico, to Muskogee, Oklahoma, where he will be deputy supervisor for the Mid-Continent district. The change follows transfer of all mineral leasing in eastern New Mexico to the Mid-Continent district.

A campaign has been started to have W. G. Skelly, president of the Skelly Oil Company of Tulsa, elected a director of the United States Chamber of Commerce. Mr. Skelly is a former president of the Tulsa Chamber of Commerce and is also president of International Petroleum Exposition and Congress.

M. W. Mattison, for the past nine and a half years the chief of division of taxation and accounting of the American Petroleum Institute, has relinquished his duties with this organization and will now devote his entire time to the business of the firm, Mattison, Davey and Winters, of which he has been a senior partner since organization.

Fred C. Cromwell, 40, driller, was fatally injured January 31 when his automobile turned over near Colorado, Texas. He was a driller on the deepest oil and gas producing well in the world in the Big Lake field, and was working for his brother, Carl G. Cromwell, San Angelo drilling contractor, at the time of his death. Funeral services were held at Strawn, Texas, February 3.

A. B. Irion, general superintendent in charge of drilling and production for Southern Crude Oil Purchasing Company, has transferred his headquarters from Wink, Texas, to the general offices of the company at Fort Worth as result of the completion of active development of the Hendrick field. L. W. Powell is now superintendent in charge at Wink.

W. H. Strang has been appointed acting supervisor of the U. S. Geological Survey for the Rocky Mountain division with Casper headquarters, vice Jack Steele who resigned, effective February 1 to go to West Africa to take charge of a development company for the Sinclair interests. Mr. Strang has had a large experience in oil and gas operations in the United States and foreign countries and has been the ranking deputy under Mr. Steele.

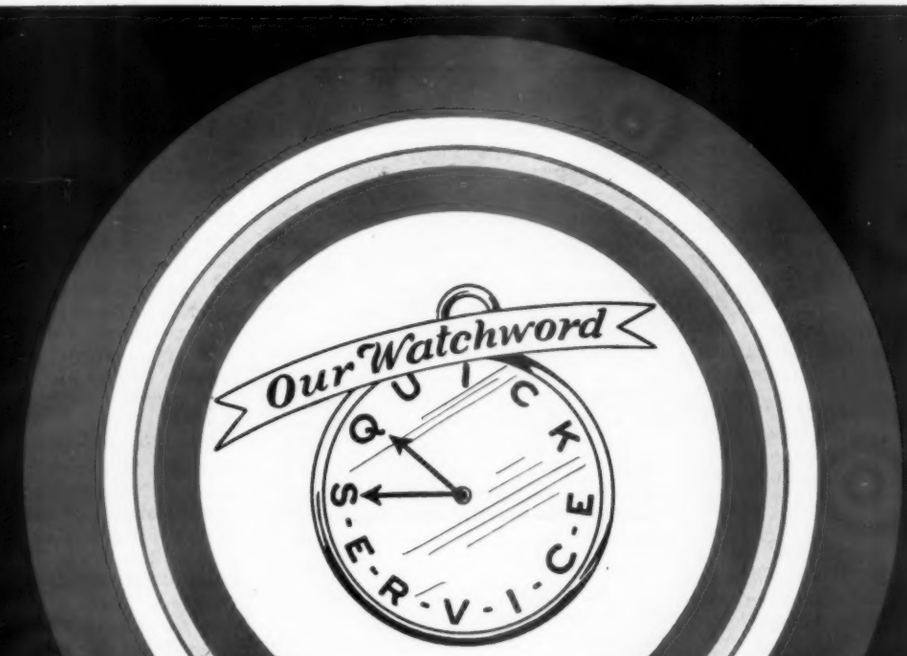
Frank P. Donohue, chief petroleum engineer for Southern Crude Oil Purchasing Company, is now located at the general offices of the company in Fort Worth after having been previously stationed at Wink, Texas, and has been relieved at Wink by F. M. Davis. Southern Crude Oil Purchasing Company et al have 195 flowing and pumping wells in the Hendrick field.

W. R. Capron, assistant to the president of Sinclair Crude Oil Purchasing Company, died in a Tulsa hospital February 8, following a brief illness. Mr. Capron had been with the Sinclair organization since 1919, when he was discharged from the army, where he reached the rank of captain during the war. Previously he had been with the Sun and the Gulf companies. He was 43 years old. His widow and two sons survive him in Tulsa. His parents, Mr. and Mrs. John C. Capron, live at Griffin, Arkansas. Mr. Capron was active in Masonic circles.

James K. Crawford, Sr., oil producer of the Mid-Continent, died at his home in Tulsa, February 6. He had been in poor health for several months. At the time of his death Mr. Crawford was president of Quartet Oil Company and secretary-treasurer of Hillside Oil Company.

A native of Ireland, he came into the oil industry in the Pennsylvania fields. Later he had holdings in other Eastern States, finally moving to Texas and later to Oklahoma. Later with two of his brothers he organized the Oklahoma Producing and Refining Corporation of America, which later was sold to Pure Oil Company. At one time he was president and part owner of the Western League baseball franchise in Tulsa.

Two brothers of Mr. Crawford are John M. Crawford and D. B. Crawford of Parkersburg, West Virginia. Another brother, Joseph, lives in Miles City, Montana. The immediate family consists of his widow, one son, James K. Crawford, Jr.; six daughters, Misses Margaret, Evelyn, Jeannette, Helen, Kathleen and Ann Crawford, all living in Tulsa.



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From South America to Canada there's B.S.&B. "Service On the Dot" and "Service On the Spot." Distributing points are located throughout the Mid-continent and Rocky Mountain Oil Fields and extend to Okotoks, Alberta, with Sales Representation at Maracaibo, Venezuela. At each of our Fifty Field Stations there are complete stocks, and our own tank crews — men employed by us exclusively — men who are trained, and instantly available to erect the tanks. (We are protected with compensation insurance—you, against PUBLIC LIABILITY—in event of accident.) *From our branch to your lease in a few hours' time,* with service always available in the field, and B.S.&B. service does not stop when the tank is erected!

B.S.&B. Perfection Vapor Pressure TANKS

Each B.S.&B. PERFECTION Vapor Pressure Tank is a complete unit in itself, although readily available for a battery. But they are more than storage tanks because they protect the valuable vapors, thereby preventing evaporation loss and maintaining well-head gravity! Each tank is equipped with the B.S.&B. Thief Hole Pressure Vacuum Valve, which opens at 16 ounces pressure or 2 ounces vacuum. This valve protects the tank as the tank protects the crude!

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Oklahoma--Kansas Field Notes

WARREN BAKER, *Staff Representative, Tulsa, Oklahoma*

South Earlsboro Extension Test Flows 250 Barrels Hour

TULSA.—Amerada Petroleum Corporation, Dixie Oil Company and Mid-Continent Petroleum Corporation's Grounds 1, SE NE NE Section 22-9-5, the semi-wildcat south of the Earlsboro pool in the Greater Seminole, Oklahoma, district, has made a good producer.

The first 12 hours the well swabbed 720 barrels and lowered the fluid to within 400 feet of the bottom. It was then deepened five feet to 4207 feet in the Wilcox sand, where it made 640 barrels in 5½ hours on the swab. Later when deepened to 4214 feet the well flowed natural for nine hours making 390 barrels. It made 105 barrels the first hour, 20 barrels the second hour, 75 barrels the third, and at the end of the nine hours was making 50 barrels per hour. It was shot with 15 quarts and swabbed and flowed 215 barrels in four hours, and Tuesday morning began flowing 250 barrels per hour and was shut in.

Magnolia Petroleum Company's Grounds 1, NE NW Section 23-9-5, in the same area, is now shut down at 4229 feet for proration. It is ready to pump.

The important wildcat of Wofford Drilling Company et al, Davis 1, SE NW Section 29-8-7, east of the Bowlegs pool, had the Wilcox sand at 4285 feet and 300 feet of water from 4288-92 feet.

In the new north extension area to the St. Louis pool, Wofford Drilling Company, R. A. Irwin, and Atlantic Oil Producing Company's McGee 1, NE NW SE Section 4-7-4, which extended the Hunton lime producing area to the north, topped the Wilcox sand at 4283-4292 feet and had 400 feet of water. It has quit flowing through the bradenhead from the Hunton lime and will likely be plugged back to that horizon and an attempt made to revive its Hunton lime production.

Gypsy Oil Company's Walker 4, SW SE Section 5-7-5, in the East Little River pool, is still blowing wild. It is estimated at 35,000,000 feet of gas.

A number of new wells were completed in the East Earlsboro field, where production continues to run around 30,000 barrels per day despite proration to 66-2/3 per cent.

Bartlesville. — Natural gas stored in old wells was used during January to supply the city of El Dorado, Kansas, by the Cities Service Gas Company. Underground storage for natural gas is still in an experimental stage by this company but its use in this instance has given officials of the concern encouragement.

During last year when the demand for gas was low, the company pumped gas back into these old wells. El Dorado is on the 20-inch main line which runs from the Texas Panhandle to Kansas City. In January when sub-zero weather prevailed in this territory, the demand for fuel reached its peak. So the requirements for El Dorado were taken from the old wells, while the pipe line system was permitted to carry all its load to other points.

Stephens County

Tulsa.—The Palacine field of Stephens County, Southern Oklahoma, was extended one-half mile to the southeast by the Dun-Mar Oil Company's Randle 1, SEc Section 9-2s-6w, which flowed 456 barrels of 35 gravity oil in the first 19 hours. It is also making 8,000,000 feet of gas while producing from sand topped at 2847 feet and drilled to 2853 feet.

Several loactions have been staked in the vicinity offsetting the well.

Clark-Cowden and Venmex Oil Company's Andrae 1, SW NE SE Section 5-2s-6w, one-half mile north of production has been plugged and abandoned as dry at 3327 feet.

Cities Service to Take Oklahoma City Gas

Bartlesville.—Following purchase of the Foster Petroleum Company holdings in the Oklahoma City pool by Indian Territory Illuminating Oil Company, announcement was made last week of the construction of a 20-inch natural gas pipe line from a point south of Perry to the Oklahoma City area by the Cities Service Company. The new line, 50 miles long, will turn gas from Oklahoma City into the natural gas system of the Cities Service interests.

The line will be an extension of construction from Dilworth to Perry completed last fall. The line will start about 15 miles south of Perry and extend to the rich Oklahoma City area, where the gas supply has exceeded facilities for its handling.

The line will have capacity of about 100,000,000 cubic feet daily. It will be completed next summer.

Oklahoma City Completions Add Much to Potential of Field

TULSA.—Rapid completion of wells in the Oklahoma City field was continued during the past week. Foremost among these was Wirt Franklin Petroleum Corporation's Lowery 3, NE NW SW NW Section 12-11-3w, along the north line of the pool. The initial flow was 1300 barrels the first hour from the Detrital sand at 6432 feet. It was pinched because of cramped pipe line conditions.

Along the west side of the field, Indian Territory Illuminating Oil Company completed Drake 1, NE SE SE Section 14-11-3w. The well made 4361 barrels the first 24 hours. The top of the Detrital sand was 6196 feet, with the producing horizon from 6324-57 feet. The bailer is in the hole.

In the center of the field, Cromwell-Franklin Petroleum Corporation, Indian Territory Illuminating Oil Company's Trosper Park 9, Section 13-11-3w, produced 10,219 barrels in 22 hours from the Detrital sand after plugging back from the Arbuckle lime to 6360 feet.

Indian Territory Illuminating Oil Company completed A. Brokaw 2, NEc Section 13-11-3w, 400 barrels per hour; Farley-Fuzzell 1, SE SE NW Section 19-11-2w, estimated 15,000 barrels, 6521 feet, shut in due to water cutting two per cent; A. Bodine 3, NW NE SE Section 24-11-3w, 393 barrels per hour initial; 6520 feet; Button 4, NW SW SW Section 19-11-2w, 500 barrels per hour, 6511 feet; Trosper 6, NE SE SW Section 13-11-3w, 78,000,000 feet of gas and 29 barrels of gasoline per hour at 6315 feet.

Skelly Oil Company's Hoopes 1, NWc NE Section 31-11-2w, the largest sand producer ever found in the field and the farthest southeast producer, has been opened up. It produced 23,820 barrels in 23 hours and 18,844 in 18½ hours, while flowing against a 200-pound back pressure. Arrangements have been made for the shipping of part of the oil to the Eldorado, Kansas, refinery of Skelly Oil Company.

Western Kansas Drilling Wells Number 209 in 36 Counties

WICHITA, Kansas.—The north offset to the Slick discovery well in the Schurr area of Rice County, Kansas, made a producer, after it appeared to be a complete failure. The well is Producers & Refiners Corporation's Thompson 1, SE NW Section 21-20-10w, and swabbed 300 barrels the first 14 hours and was then shut in until tanks could be erected. It is estimated good for 500 barrels per day.

The well ran considerably lower than Slick et al's Schurr 1, and failed to find the producing horizon of the Schurr well. It is producing from the Siliceous lime topped at 3329 feet and drilled to 3331 feet. The Schurr well yields a natural gasoline (53.4 gravity crude) from 3289 feet, while the Thompson well has a gravity of but 41.

Voshel Pool

The Voshel pool of McPherson County, is estimated to have a potential production of 11,000 barrels from seven wells at this time. Production is pinched to 50 barrels each, but under plans to be effective February 15 the wells will be allowed to produce around 3000 barrels daily, this will be 25 per cent of the open flow outlet. The operators committee in the field decided on the increased proration in order to leave more room for additional producers scheduled to be completed very soon.

Center of interest in the state at this time is McPherson County, where there are 58 operations. Commencing five years ago nearly every major company in the Mid-Continent has worked the area. Besides the geologists the torsion balance and magnetometers have been used.

Western Kansas continues to be very active with 209 operations in 36 counties west of Greenwood. Operations by counties follow: McPherson, 58; Sedgwick, 16; Scott, 1; Rush, 3; Barber, 4; Sumner, 14; Dickerson, 4; Harvey, 7; Barton, 2; Clarke, 1; Edwards, 3; Ellis, 10; Ellsworth, 1; Ford, 2; Harper; Hodgeman, 2; Kingman, 2; Norton, 1; Osborne, 2; Pawnee, 2; Pratt, 3; Rice, 10; Rooks, 1; Russell, 7; Sheridan, 1; Smith, 1; Stafford, 1; Stevens, 5; Trego, 5; Cowley, 14; Saline, 3; Clay, 1; Butler, 12; Marion, 1; Reno, 4; and Graham, 1.

Tariff Advocates to Hold Series of Meetings

Tulsa. — Meetings are to be held in Tulsa, Ardmore, Duncan, Wichita, and other Mid-Continent oil towns, according to plans of the Independent Petroleum Association of America, at which time the organization is expected to be perfected. This became known as the tariff special train returned to Tulsa from Washington, where the delegation carried on a fight for a tariff on crude oil.

Bassett Galloway, Oklahoma City, will preside at the meeting in the state capitol, which will be held Tuesday night. George A. Dye will be in charge of the tariff meeting in Tulsa.

The oil men plan to return to Washington when the senate finance committee gets to the free list section.

Plans, with Thomas Flynn of Robinson, Illinois, heading the move, are to tell operators in Illinois and Indiana the purposes and ideas behind the association and solicit their aid in carrying on the tariff fight.

Wirt Franklin, president of the Independent Petroleum Association of America, remained in Washington.

Humble Earnings in 1929 Reach $32,000,000

Houston. — Humble Oil & Refining Company's profits during 1929 amounted to approximately $32,000,000. That amount represents in increase over the profits in the previous year.

This information regarding the company's earnings was incorporated by W. S. Farish, president, in a statement read to stockholders in annual meeting February 10. The complete statement of Mr. Farish was as follows:

"Our profits for 1929 will show approximately $32,000,000, which is approximately 9.2 per cent on a fair valuation of the company's properties. Approximately $2,500,000 of these profits resulted from the sale of our properties in Oklahoma, Arkansas and North Louisiana, from which territory we withdrew because operations there were not profitable. This is better than 1928, where we showed a profit of 6.9 per cent.

"Our increased operating profits are the result of our very large capital expenditures, and are moderate when you take into consideration the uncertainty and hazards of the oil business. The annual statement showing the company's condition is not yet completed, but will be issued by the end of the month.

"With conditions in the industry as they are today, it would be almost reckless even to make a guess as to the result of operations during 1930. All that we can say is that your officers and directors will continue the same conservative policy as they have been following in the past.

"There does not occur to me any particular matter of especial interest to the stockholders that has transpired during the past year. Our list of stockholders has materially increased. Approximately 3716 employes of the company carried out their employes stock purchase agreements ending December 31, 1929, and will receive stock in the company in the distribution under the plan. In my mind this denotes a healthy interest and appreciation spirit on the part of the employes.

"At their November 27 meeting, the directors adopted a plan providing for the payment of a bonus to employes who, by unusual services or conspicuous ability, have seemed worthy of further recognition by way of additional compensation.

"We appreciate the loyal efforts of the employes and the support of the stockholders of the company, and have confident hope that such will continue."

Wood County

Tulsa.—The Sinclair Oil & Gas Company's Share 1, C E½ NE SW Section 33-27-16w, west of Alva, Woods County, Western Oklahoma, is still trying to jar loose the tools which are stuck in the hole with the total depth 6745 feet. The hole is now full of water and the test is making no gas.

Recently this well encountered approximately 15,000,000 feet of gas from 6740-45 feet. The gas blew the tools up in the hole and later started making salt water, which killed the gas flow. It is believed that the water can be shut off as soon as the tools are out of the hole.

The same company's Howell 1, C SW SW Section 14-26-24w, southwest of Buffalo, Harper County, is drilling below 7000 feet. Five-inch casing will be run and the test drilled deeper. This is the deepest test ever made in this section of the state.

Pottawatomie County

Tulsa.—A new producer in the Wofford area north of St. Louis in Pottawatomie County, Oklahoma, was Sinclair Oil & Gas Company's Krouch 1, NE SW Section 4-7-4. This well blew in while trying to run the eight-inch casing and was making 25 barrels hourly from the Hunton lime at 3718-30 feet. It was still in a rotary hole.

The discovery well, Atlantic Oil Producing Company; Wofford Drilling Company and R. A. Irwin's Morgan 1, NE NW SE Section 4-7-4, continues to produce around 800 barrels per day.

Noble County

Tulsa.—Washoma Oil Company, Peerless Oil & Gas Company et al's Wentz-Barker 1, NW NW SW Section 22-22-1e, wildcat near Otoe, Noble County, has been plugged back to 3305 feet after drilling deeper in the Layton sand and encountering water. It swabbed 95 barrels after plugging back.

Caddo County

Tulsa. — Ramsey Petroleum Company has staked a location for a test in the NW NW SW SE Section 31-6n-9w, on the edge of the Cement field, Caddo County, Oklahoma. It will be a deep test on a large block of acreage.

North and West Texas Field Notes

H. H. KING, *Staff Representative, Fort Worth, Texas*

Ector County Gets Another Well And Ten More Locations

SAN ANGELO, Texas.—Extending production in Ector County's only field about three-quarters of a mile to the north, Cosden Oil Company's University 1-A flowed 1136 barrels of 34.5 gravity oil during 24-hour period ending Tuesday morning. This well logged production at 3596 to 3654 feet, where tools were lost and recovered promptly, but failed to increase its flow when deepened in hard lime to 3670 feet. Its completion gives Cosden Oil Company the two best producers in the field, and has been followed by the making of 10 new locations by various operators in the field on proven drilling sites.

Negotiations are being made by Cosden Oil Company for a market outlet on the crude. A West Texas refinery has contracted for 1500 barrels daily for one year from the Landreth Production Corporation, and is at work on a pipe line to handle the oil direct, while two or more major pipe line companies are now sure to invade the field. No organized effort has been made by the operators to enforce a curtailment of drilling, but proration rules are considered inevitable.

Initial gauge taken on Cosden Oil Company's University 1-A showed it flowing 875 barrels of clean oil during the first nine hours ending at 7 a. m. February 10 with tools and 1200 feet of wire line in the hole. This well began making oil in lime at 3596 feet, with a substantial increase at 3640-54 feet, or 389 feet in the big lime. It has a surface elevation of 2914 feet. This new producer is located in the southeast corner of the south one-half of the north one-half of Section 1, Block 35. The Humble-Penn-Atlantic interests had rigged up for an east offset with Kloh 2-D, and will have another location to make, since Landreth Production Corporation is to offset the new producer to the south.

Gulf Makes Location

Gulf Production Company joined the ranks of operators in the Ector County field Monday when a truck train loaded with two strings of cable tools, steel derricks, etc. departed from the company's West Texas warehouse. Location was previously staked for University 1 to be drilled in the southeast corner of Section 1, Block 35, and also for University 1-A to be drilled in the northeast corner of the north half of the south half of Section 2, Block 35. These sites are two locations north and south of production, respectively, and will cause the drilling of one each by Cosden Oil Company and Landreth Production Corporation, while the Humble-Penn-Atlantic interests will draw four new offsets to the east. Amerada Petroleum Corporation and Skelly Oil Company are joint owners of 160-acre strips to the north and south of production, and will be forced to join the campaign.

The Humble-Penn-Atlantic's Kloh 1-D revived interest in the old Connell, or Judkins pool, last October with a small flowing well, and are now almost certain to drill 16 locations in a single row along the west side of their six-section block, with a like number of locations on University fee lands held under lease by the above mentioned companies. Llano Oil Company's T. S. Hogan 1, located in the northwest corner of Section 18 and southeast of production, is the only test in the area nearing the lime horizon, and early this week was running 8¼-inch casing at 2600 feet.

Production to Storage

Production from Cosden Oil Company's two flowing wells is going to field storage, while similar disposition is being made of production by Landreth Production Corporation. The two offset wells of Humble et al are pinched to 100 barrels daily, but served by a temporary two-inch line of the Gulf Production Company. Burford Oil Company has contracted for 1500 barrels of production daily at the market price for one year from Landreth Production Corporation, and is unloading materials to build a 40-mile four-inch line from Hendrick field to deliver Ector crude along with a limited supply of Hendrick crude to its refinery at Pecos. Burford Oil Company and Skelly Oil Company are joint owners of a six-inch line that extends from the Hendrick field to Pecos.

Three rigs are being assembled by Deep Rock Oil Company, The California Company and Atlantic Oil Producing Company to proceed with the exploration of their large partnership leasehold surrounding a 200-barrel flowing well in Andrews County from broken lime at 4345-4428 feet. This area is rated as being the second best bet on future potential production in West Texas, with the Judkins field now safely holding first honors. Another 10,000-barrel storage tank was purchased last week, making a total of 24,000 barrels, for this wildcat producer.

Encountering a record flow of 700 barrels of sulphur water per hour in lime at a total depth of 3566 feet, Gulf Production Company's O'Brien 7 has been successfully plugged back with cement and plugs to 3252 feet to try and develop oil production from horizons passed up while giving this section of Ward County a deep test. This well is located in the southwest corner of Section 22, Block "F," and on the west side of the O'Brien field, which is apparently in full possession by Gulf Production Company.

Loving County

The Wheat field, Loving County, has received four new locations since the recent extension of the oil area one mile to the east by Independent Oil & Gas Company's Wheat 1, which continues to flow about 300 barrels daily after plugging back from water at 4317-20 feet and shooting with 120 quarts in the Deleware. Lockhart & Company made one; The California Company two, and Hadlock et al made the other.

A steady flow of 2435 barrels of net oil daily, plus about 10 per cent water, is being maintained by Warner-Quinlan Company of Texas' University-Weekly 7, which was completed January 15 making 4100 barrels initial at 2871-77 feet in the western part of the Church & Fields area, Crane County. This well is credited with having produced 59,871 barrels of pipe line oil during the first 20 days on production, and did not develop water trouble until the sixth day on open flow. This is an unusually large well for the upper section of the lime, and peculiar in that it is one of the few producers in the field to make water in the upper region, while offset wells have been carried much deeper to make small producers and no water. About 10 per cent b.s., besides the water, is included in the output, but the former settles out readily, while the water is easily separated with chemical. Phillips Petroleum Company is handling about two million cubic feet of gas daily from this well through its natural gasoline plant.

Three Wildcat Strikes in Three Counties in North Texas

WICHITA FALLS, Texas.—Three wildcat strikes in as many counties and a 100-barrel per hour producer in Wilbarger County enlivened activity in the North Texas district during the past week after experiencing a month of partial shutdown because of adverse weather conditions. Wilbarger County's contribution came from Zenith Oil Producing Company's M. J. George 2, located midway between the old Sigler pool and the South Vernon field, and the well flowed 440 barrels during a four-hour gauge after logging 20 feet of sandy-lime at a total depth of 2217 feet. Crude purchasing companies serving nearby wells refused a pipe line connection, and the owners are seeking to dispose of their oil through common carrier runs to independent refiners in the district.

Deep lime production in Jack County was developed late last week when the Prairie Oil & Gas Company's wildcat test on the W. B. Munson farm, located several miles east of the Buttram pool, filled 3000 feet with high gravity oil in hole after topping lime at 4685 feet. This test is located near the center of the west line of the BS&F Survey No. 3, Abstract 82, and should it prove to be a successful completion offsets will be required of Bert Shaw et al and Rathke et al. The hole is cased with 8¼-inch pipe at 2520 feet, and operations were suspended to run 6⅝-inch casing before deepening. Production in the Buttram pool is from the Strawn sand and is only one-half as deep.

Cooke County's contribution to the wildcat strikes came from the Kewanee Oil & Gas Company's J. H. Montgomery 1, which swabbed two barrels of oil per hour, with small percentage of salt water, from sandy-lime at 1186-1201 feet. It is located more than a mile southeast of the Dennis pool section of the Bulcher district, and in the southeast part of the J. B. McClyman Survey, Abstract 735. A. C. Hill et al had made deal to drill a test on acreage several locations to the south of the wildcat producer before the discovery of oil, and Gulf Production Company donated a 40-acre drilling site for a one-sixteenth over-riding royalty.

An addition to the series of shallow oil pools in northern Young County was assured late last week when the wildcat test of C. C. Williams et al on the C. J. Taack land, located about one mile southwest of the town of True, developed hole full of oil from sand at 670-72 feet. This wildcat is expected to make a 50-barrel pumper, or more if deepened. It is located in the southwest portion of Section 263, TE-&L Survey.

Successful Completions at Van Require More Offsets

CORSICANA, Texas.—Production in the Van field was averaging above 8100 barrels daily early this week as result of the addition of two new wells on outpost locations. The eight completed wells have a combined daily potential flow of more than 50,000 barrels, but all are flowing through chokes ranging from one-eight of an inch to one-inch in size, since transportation of the oil to refineries is limited to tank car shipments. These completed wells require seven immediate offsets, while the approaching completion of three other tests on proven acreage will necessitate the starting of a total of nine tests shortly. The Pure Oil Company is the sole operator in the field in accordance with the unit plan of development.

Van field has maintained its perfect record for successful oil completions although the first group of tests have been scattered over a wide area and to low points on the supposed salt dome. The danger zone for water is not known, nor has the existance of a salt plug been definitely established. The field became definitely proven for flush production for a length of about two miles in a northwest to southeast direction February 6 when Pure Oil Company's A. F. Magers 1 gauged 583 barrels in 16½ hours, through 2½-inch tubing and a one-inch choke from Woodbine sand at 2834-63 feet. This well is slightly more than one mile north of the nearest production, and is the lowest on structure, but is producing the highest gravity oil of the group, with a normal temperature. The gravity is reported to be 37.7° gravity (corrected). It gauged 893 barrels during the 24-hour period ending 7 a. m. February 10 flowing through one-inch choke, with 275 pounds pressure recorded at the casinghead. Shell Petroleum Corporation's E. L. Fowler 1, which widened the productive area to the east, when washed in with tubing set at 2696 feet February 4 made 1714 barrels during first full gauge through one-half inch choke. It logged a record thickness of 239 feet of broken Woodbine sand, having a total depth of 2699 feet and seven-inch O. D. casing cemented at 2460 feet.

Direct railroad facilities for the Van field are being proposed by the Texas Pacific Railroad, with an 11-mile extension from Grand Saline, while the Cotton Belt has petitioned the Interstate Commerce Commission for permission to build a 19-mile extension from Chandler. The latter is transporting all oil from the field from Pure Oil Company's rack at Chandler, while the former carrier enjoys a monoply on inbound shipments of oil field supplies, with trucks completing deliveries from Grand Saline.

Tank car shipments of crude from Van may be eliminated, or reduced to a low level by midsummer, as this method of marketing the oil is more expensive than through direct trunk lines. Surveyers are at work on picking a tentative route for a line extension from a point near Teague to the Van field by Pure Oil Pipe Line Company of Texas, which is a subsidiary of Prairie Pipe Line Company, while Pure Oil Company is expected to announce plans for immediate construction of a 10-inch line to the Coast. Construction of the extension from Teague would require only 70 miles of pipe, but its fate depends upon the Prairie interests making a purchasing or transportation deal with Pure Oil Company.

T. G. Shaw-Fagg et al's wildcat test on the W. F. Huddle 100-acre tract, L. Richardson Survey, located about five miles southwest of the Van field, had drilled below 3000 feet late last week without encountering the Austin chalk. The log of this well does not compare favorably with Van field producers. In Titus County, W. L. Murrell, Geo. M. Anderson of Dallas and associates have assembled a block of 8500 acres to drill a Woodbine sand test in the northeast corner of the H. G. Walcott and M. E. Lott 160-acre tract, D. M. Smith Survey. R. H. Dearing & Sons, Dallas contractors, are moving in rotary to drill this wildcat on contract.

Texas Panhandle Wildcat Makes 20 Barrels Hour

Amarillo, Texas.—The Texas Panhandle received its first distinct wildcat oil producer in many months when the Empire Gas & Fuel Company's J. W. Fields 1 developed a flowing well on the south flank of the granite ridge in Carson County. The well made an initial flow of 20 barrels of high gravity oil per hour with about one-half million cubic feet of gas from granite wash formation at 3200-05 feet. Its performance disproves old theories that commercial oil production is not obtainable on the south flank of the submerged ridge in Carson County. The well is 1650 feet south and west of the northeast corner of Section 13, Block 7, I&GN Survey, and near the center of about 15 sections of land held under lease by Empire Gas & Fuel Company. It is about three miles southeast of Culbertson Brothers Company's Armstrong 1, which made a bid for production late in 1924 at the 3100-foot level, but was later plugged as a failure at 3560 feet. The latter logged the top of the lime at 2482 feet, with a surface elevation of 3390 feet.

F. W. Dillard of Pampa and associates recently developed a 60-barrel producer on the south flank of the ridge in Western

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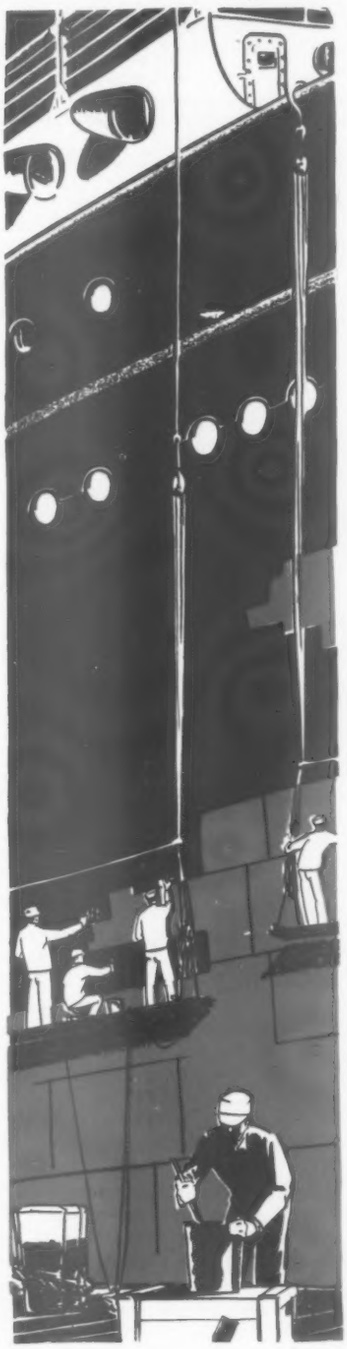

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Gray County when Wilson-Furneaux 1, Section 202, Block B-2, H&GN Survey, plugged back from 3475 to 3215 feet. Production was encountered in granite wash at 3074-80 feet, with a 10 million cubic foot flow of dry gas in the upper section of the formation.

Gray County registered a daily average production of 56,075 barrels during the past week, or 1085 barrels above the average for the previous week. This increase was partially due to the heavy flow of high gravity oil from Magnolia Petroleum Company's J. E. Wright 3, which was brought in January 31, making four and one-half million cubic feet of gas and 7000 barrels of clean oil daily from granite wash at 2838-48 feet. The production of this well was 5156 barrels during the 24-hour period ending February 7, and an average of 5541 barrels daily was maintained for the first seven and a fraction days. The gas tests one and six-tenths of a gallon of gasoline per 1000 feet. Derrick is up for Wright 4 to be drilled in the southeast corner of the south half of the southwest quarter of Section 13, Block 3, I&GN Survey, and The Texas Company's J. E. Wright 1 is rigging up to make an east offset, while Danciger Oil & Refining Company and Champlin Refining Company will have two offsets to drill to the south of these new locations.

Williamson County Well Gets Line Connection

San Antonio, Texas.—Field storage and a gathering line have been ordered erected by E. L. Chapman and G. B. Peterman to serve their completed wildcat flowing well on the J. C. Abbott land, located in southeastern Williamson County and about eight miles southeast of the old Thrall field. This well blew in January 18 flowing at the rate of 500 barrels daily from Pecgan Gap chalk formation at 1831-34 feet, and was allowed to produce into earthen storage until a string of 5 3/16-inch casing was set late last week and flow lines connected to a 5000-barrel storage tank. It was reported to be flowing about 400 barrels of 36.7° gravity oil daily via 3/8-inch choke Monday.

Chapman et al have arranged for the immediate construction of a 27,500-barrel steel tank near the well, with an eight-mile six-inch line scheduled to be built from this point to a tank car rack on the I&GN Railroad about one and three-quarter miles east of Thrall. The oil is to be offered to independent refiners in tank car lots. J. W. Kemp of Taylor, Texas, drilled the discovery well on contract, and has been awarded contract by Chapman et al to start drilling on a south offset to the producer on the L. W. Fuch farm, and also a test on the S. W. Lawrence farm, which will be a southwest offset. Simms Oil Company is moving in rotary to drill east of the producer on the Lawrence land, and a number of other nearby locations have been staked, or are moving in materials.

Texas Committee Makes Progress in Curtailment Plans

(Continued from page 34)

the drill, but current production is at the maximum requirements of purchasing companies, and operators do not favor building their own storage facilities.

The situation in the Refugio field, Southwest Texas, is being aggravated by town lot drilling and development of a series of oil producing horizons. A single pipe line, which is owned by the W. F. Morgan Interests, and tank car shipments afford the only market outlet for Refugio crude. Production of this field leads all Gulf Coast fields in daily output, and after summarizing the situation the general committee tentatively decided to influence operators in holding Refugio's daily yield to its current level, or less. A representative of the Morgan Interests assured the committee that the pipe line company would cooperate in preventing overproduction and waste in the Refugio field. Further discussion on the Refugio field was to occur in Houston on February 7 with the principal operators holding a conference with members of the general committee.

The series of fields comprising the North and Central West Texas districts, where the average crude yield per well is only about five barrels daily, were passed up by the general committee as being a suitable area to curtail current production. Adverse weather conditions and local enforcement of proration of pipe line runs and purchases have greatly reduced production since the first of January in the principal fields. In North Texas, Wilbarger County has sustained a production loss of 6000 barrels within the past six weeks, and is headed for lower levels because of the Waggoner Estate having a shut-down order in effect on its lands. Two of the major purchasers in this county have also been prorating oil takings.

Central West Texas has undergone a natural production curtailment through lack of new areas to develop, and by reason of limitations placed on crude purchases in a number of scattered pools by Humble Oil & Refining Company. Flush production of any consequence has not appeared in this district for months, and none is in sight, so the committee elected to pass it up in their search for the 100,000-barrel quota.

While no action was taken on the growing threat offered by the prolific field near Judkins, Ector County, the committee considered it will be properly handled when pipe line companies build in and service wells now pinched to about 100 barrels daily. This area is destined to be the next major oil field in West Texas and will be controlled by a proration plan. Winkler County's fields and pools are registering a steady decline as a whole in output, with proration rule in effect, and will not be included in the areas recommended for a cut in crude production. The Howard-Glasscock County district was also scratched, as all wells are completed as pumpers, and the proration rules of the commission applying to the 2200 and 3000-foot horizons have held production to the market outlet. The daily allowable production of wells in the two prorated horizons is determined by the volume of oil nominated each month by purchasing companies as being their requirements. Other smaller fields in West Texas were checked over by the committee, and found to be cooperating sufficiently to the general program of curtailment.

Representatives of companies taking part in the unitized development of the Van field, which is a prolific high gravity oil area in Central East Texas, reported that the field's output would probably not exceed 25,000 barrels daily this year, while it is now averaging about one-third of said figure. Market outlet for the field is confined to tank car shipments, and some months will elapse before one or both of the proposed direct pipe line connections for the field become available. No action was taken by the committee on this field.

Recent deep sand discoveries in the Gulf Coast salt dome district, particularly at Barbers Hill and Humble, came in for serious consideration by the general committee. The big producer at Barbers Hill has boosted the output of the field about 33 1/13 per cent since its completion early in January, and clings to its initial flow of about 8000 barrels daily. The committee was informed that this well can not be throttled any appreciable extent because of running into mechanical difficulties, and that it has not started a drilling rush on nearby acreage. The situation at Humble is to be passed back to the local operators for definite action on holding excessive production in check in the recently discovered deep horizons.

Ector Pipe Line

Fort Worth, Texas.—Burford Oil Company is starting work on a 40-mile four-inch pipe line to extend its West Texas system from the Hendrick field to the Judkins field, Ector County, having contracted for 1500 barrels of oil daily for one year at the market price. The contract was made with Landreth Production Corporation, which has a 900-barrel producer and other tests starting. This new crude supply will supplement that now being taken from the Hendrick field by a six-inch line to the refinery of Burford Oil Company at Pecos. Burford Oil Company will also take oil from the jointly owned leases of Skelly Oil Company and Amerada Petroleum Corporation in the Judkins field when proposed tests are completed.

Houston.—At the regular weekly luncheon of the Houston Geological Society on Tuesday, February 11, the feature of the program was a discussion of "The Geology and Pavements of Cuba," by Russell F. Ryan.

Gulf Coast Field Developments

JACK LOGAN, *Staff Representative, Houston, Texas*

Barbers Hill Deep Producer Declines Slightly

HOUSTON.—Humphries Corporation's Kirby 8-A, semi- wildcat which discovered deep production at 6397-6416 feet on the northwest flank of Barbers Hill dome, had produced a little over 300,000 barrels on Tuesday, February 11, 1930—a month and a week after coming in. The report of February 11 showed production of 6272 barrels during the preceding 24 hours. That figure represents a slight decline in production, but is due partially to pinching of the well with smaller chokes.

The well is flowing through four-inch drill pipe which had been lifted off bottom to the extent of only one joint, and through the 7⅝-inch casing. As a result of further pinching of the well, the pressures have increased. On the drill stem there is now a 13/16-inch choke taking the place of the former one-inch choke, and the pressure is around 535 pounds, whereas it was 450 pounds previously. A one-half-inch choke has replaced a one-inch choke on the casing, and the pressure now is 160 pounds, as compared with 135 to 150 pounds previously.

Humphreys Corporation A. E. Barber 1-F, south offset to Kirby 8-A, and only well started in that part of the field following blowing in of Kirby 8-A, was drilling at 1352 feet on February 11.

The only well completed at Barbers Hill during the past week was Mills Bennett Production Company's Means 2, on the northeast flank. It came in flowing 1750 barrels 27 gravity pipe line oil daily at 5137 feet.

On the northeast flank of the field Humphreys Corporation's Kirby 2-C is fishing at 4675 feet; McLean 1 has an oil showing in sandy shale at 5515 feet; Ilfrey 2 is drilling shale at 3165 feet, and Morgan 1 is drilling hard lime at 2130 feet.

Yount-Lee Oil Company's Chambers County Agricultural Association 11 on the south flank of the dome is preparing to drill deeper, following unsatisfactory test in oil sand at 5440-5500 feet; No. 12 and No. 13 are derricks; and Zadie Fisher 1 is drilling shale at 3325 feet.

Sun Oil Company's Wilburn Fee 4 is drilling shale and lime at 4195 feet; Wilburn 3 is drilling at 2000 feet; J. F. Wilburn 4 is rigging up; Chambers County Agricultural Association 4 is drilling at 4750 feet in sand showing oil.

Mills Bennett Production Company's Wilburn 3 is rigging up; Sinclair Oil & Gas Company's J. Wilburn 3 is drilling shale at 4972 feet; J. Wilburn 4 is drilling gumbo at 2000 feet; Wilburn 5 is rigging up. The Texas Company's Lawrence 1 is swabbing salt water and slight oil showing at 5367 feet. Gulf Production Company's J. F. Wilburn 2-A is rigging up. Unice Oil Company's Feldman 2 is drilling hard lime at 4225 feet. McAlbert Oil Company's Woodward 4 is pulling screen to reset at 5120 feet.

Abandoned Evangeline Test in Cap Rock

Houston. — Yount-Lee Oil Company's Crowley Oil & Mineral Company 5 at Evangeline, Acadia Parish, Louisiana, has encountered cap rock and has been abandoned in that formation at 4560 feet after drilling into it about 200 feet.

The test was located near the center of the east flank of the field, approximately 1800 feet of the same company's Houssiere-Latrielle 7, second of the two wells of Yount-Lee Oil Company at Evangeline completed as producers below 7000 feet. Houssiere-Latrielle 7, in turn, is 500 feet north of No. 6, the discovery well of the deep sand. Number 6 is still producing at 7292 feet, although completed over eight months ago. Number 7 has stopped flowing and is now standing. Its depth is 7447 feet.

Location of the test which has just been abandoned is 4245 feet east and 410 feet north of the southwest corner of Section 48-9s-2w. The two wells completed below 7000 feet as producers are in Section 47.

Following abandonment of Crowley Oil & Mineral Company 5, Yount-Lee Oil Company has made location for No. 6 at a point 545 feet east and 220 feet north of No. 5.

Aside from the rig that was used on the well that has just been abandoned, Yount-Lee Oil Company has two other rigs at Evangeline drilling deep tests around the edges of the dome, Houssiere-Latrielle 8, located on the southeast side of the field, is drilling sandy shale at 3600 feet, and Y. L. Simms Fee 1, located on the west side of the field in Section 45, is drilling below 7200 feet.

The Texas Company is drilling a deep test, Rayne Heirs 5, on the south edge of the field in Section 40-9s-2w. The test is drilling below 6500 feet.

Fort Bend County

Houston.—Pure Oil Company has made location for a wildcat test on a geophysically outlined prospect near Pilant Lake, in the southeast part of Fort Bend County. The well is to be Jackson Brown et al No. 1. Location is in the William Barrett and Abner Harris Survey, 1481 feet south and 1900 feet east of the northeast corner of the Herman Hale 548.92-acre tract.

Refugio Given Extension; Production Increase Continues

HOUSTON.—Late developments in a semi-wildcat test at Refugio indicate possible extension of oil production approximately two miles northeast of the present limits of the field. This extension test is Houston Gulf Gas Company's M. F. Lambert 1, located in the Refugio town tract, about two miles northeast of Union Producing Company's O'Brien 1, the nearest producer, and incidentally the discovery well of a recently found 5500-foot oil sand. A drill stem test was made in Houston Gulf Gas Company's M. F. Lambert 1 late last week in a sand at 5890-95 feet, and the well showed 15 fourbles of oil. It is a different oil from that produced by O'Brien 1 and the several other 5500-foot wells on the eastern edge of the field, being a brown oil.

This well had a gas sand at 3500 feet, but did not encounter the 3700-foot oil sand which is furnishing the bulk of present Refugio production.

To the southeast of the promising semi-wildcat are two old gas wells, drilled several years ago by Houston Gulf Gas Company and Houston Oil Company, and completed as gas producers around 2000 feet.

During the past several weeks Refugio oil production has been steadily increasing to new peaks, and now the field is producing considerably more oil than any other area along the Gulf Coast. During the week ending February 10 the average daily production was 35,900 barrels from 87 wells, an average per well of 422 barrels daily.

Aside from the above mentioned semi-wildcat located northeast of present production, Refugio activity at present in-

cludes further drilling of interest in the deep sand area of the east side of the field, with two wells there nearing completion. Both are Union Producing Company tests. Shelton 1 has set screen in oil sand at 5507-13 feet and early this week was being swabbed. O'Brien 2 has set 4½-inch casing on oil sand at 5554-68 feet.

In the past three oil producers and one large gas well have been completed in this so-called "O'Brien sand." The oil wells include the discovery producer, Union Producing Company's O'Brien 1, the same company's Mitchell 2, and Saxet Oil Company's Ryals 1. The gas producer is Union Producing Company's Powers 2.

The present production from the 5500-foot wells is almost 2000 barrels daily. During the week ending February 3, 1930, their average daily production was as follows: Union Producing Company, O'Brien 1, 504 barrels, Mitchell 2, 641 barrels; Saxet Oil Company's Ryals 1, 741 barrels.

The discovery well, Union Producing Company's O'Brien 1, was completed September 26, 1929, at 5509 feet, and by the close of the year had produced approximately 30,000 barrels. By the end of January, 1930, that total had increased to approximately 45,000 barrels. The other two deep wells have been completed recently.

During the past week there were four wells completed at Refugio. Morgan Oil Corporation's City 4 came in flowing 800 barrels pipe line oil daily through three-eighths-inch choke, and showing 450 pounds pressure, from sand at 3688-37-6 feet.

Rutherford Traylor Oil Company's Town Block 77, well No. 1, came in flowing 850 barrels pipe line oil daily through two 7/16-inch chokes, with 300 pounds pressure from 3676-3705 feet.

The other two completions at Refugio during the past week included Herman Heep Oil Company's Rutherford 1, which came in flowing 1700 barrels daily at 3674 feet, and Independent Oil & Gas Company's West 2, a 700-barrel well at 3677 feet.

There are also six wells at Refugio which are nearing completion. Union Producing Company's Shelton 1 and O'Brien 2 are two of them, and the details on those deep tests are given above. That same company's J. F. B. Heard 2 has cored oil sand at 3663-68 feet. Houston Gulf Gas Company's J. T. Vance (Morgan) 2 was swabbed in during the week but appears to be sanded up in the screen, and tubing is now being pulled to rework it. Morgan Oil Corporation's Swift 1 came in flowing 280 barrels pipe line oil daily on 5/16-inch choke, with 1000 pounds gas pressure, but the well has been killed and liner has been pulled to reset with purpose of reducing the pressure.

Refugio Oil Corporation's Wheeler 1, came in flowing salt water when screen was set in sand at 3675-87 feet. Independent Oil & Gas Company's Reilly 6 is standing with 9⅝-inch casing set and cemented on sand showing oil at 3672-79 feet.

Gross Production of Refugio Field During January, 1930

Operator, Lease—	No. Wells	Barrels
Benedum & Trees		
Clint Heard	1	4,682
F. B. Rooke	1	6,321
Houston Gulf Gas Company		
Morgan Vance	1	15,053
T. P. Shelly	2	17,378
Ryals	2	4,142
Cummings	2	14,892
Fannie Heard	1	1,298
Morgan Shelly	2	22,468
Rooke (Union Ex)	1	2,773
Houston Oil Company		
Fannie Heard	2	3,585
Rooke (200 ac.)	3	29,491
Rooke (36 ac)	1	2,473
Rooke (472)	3	14,509
Wilson Heard	3	3,780
Helen Ryals	1	2,965
Independent Oil & Gas Company		
Claud Heard	2	20,901
Jerry Reilly	3	26,560
West	2	21,773
J. F. B. Heard	1	1,936
Morgan Oil Corporation		
City of Refugio	3	42,430
Fox Heirs (Blk. 71)	1	3,154
Fox Heirs (Blk. 72)	1	21,650
Fox Heirs (Blk. 75)	1	12,195
Fox Heirs (Blk. 76)	1	21,521
Fox Heirs (Blk. 114)	1	5,401
Johnson	1	7,841
Strauch	1	8,454
Dr. W. E. Hewitt		
Cemetery	2	3,000
Pearson Properties, Inc.		
Babb	1	21,611
Fox Heirs (40 ac)	2	22,962
Simpson	1	17,324
Swift et al	1	5,859
Claud Heard (Blk. 27)	1	4,088
Rogers (Tex. Gas Co.)	1	6,379
Refugio Oil Corporation		
Murphy	2	142,307
Rutherford Traylor Oil Company		
Block 92	1	5,859
Saxet Oil Company		
Clint Heard	5	26,950
City (Blk. 74)	1	7,544
Serafino	1	1,898
Fox Heirs (Blk. 95)	1	12,150
Powers	1	24,610
Ryals	1	*843
Sun Oil Company		
Buckley	1	11,768
Leisering	2	29,505
Rea	2	7,221
The Texas Company		
Clint Heard	1	255
Union Producing Company		
Shelly	3	5,054
Kuykendall	1	6,669
Shay	1	4,245
Strauch	1	3,901
Duddleston	1	3,264
Dabney Fee	1	24,444
Block 99	1	9,162
Eskridge Heard	1	7,108
O'Brien	1	14,723
Mitchell	1	14,046
Total	84	784,382

*Total shown for Saxet Oil Company's Ryals 1 is amount delivered to pipe line. Approximately 3500 barrels in storage not shown.

Lost Lake

Houston.—Pure Oil Company abandoned two tests at Lost Lake, Chambers County, during the past week. Mayes 6-A was abandoned in cap rock at 3290 feet. It was located 600 feet from the nearest producer, Mayes 5. The other test that was abandoned was Mayes 4, which had tested fresh water with only a little oil at 2818 feet. That well was originally drilled to 3396 feet, but was plugged back.

Pure Oil Company's other operations at Lost Lake are as follows: Mayes 9 has set casing at 2657 feet and is waiting on cement to set. Mayes 10 is still a location. Lost Lake 4 is drilling gumbo at 820 feet.

Gas Line Extension

Houston.—Houston Pipe Line Company has completed a 12¾-inch natural gas extension line from Boling to Long Point, a distance of approximately 13 miles, to serve the sulphur mining plant which Texas Gulf Sulphur Company expects to have in operation at Long Point this spring. Houston Pipe Line Company already had a 12-mile line connecting Texas Gulf Sulphur Company's Boling dome sulphur plant with the pipe line company's trunk line at Wharton. The natural gas supply of Houston Pipe Line Company comes from Refugio and fields of the Laredo district. Houston Pipe Line Company is a subsidiary of Houston Oil Company of Texas.

Pettus

Houston.—Union Producing Company's Ray 6, located one mile north of Humble Oil & Refining Company and Houston Oil Company's McKinney 1, discovery oil well of the Pettus field, northeastern Bee County, has tested three fourbles of oil and sand through drill stem test made at 4414-19 feet. The well had previously tested two fourbles of oil at 4412-14 feet.

The above mentioned discovery oil well is shut in pending erection of storage. It came in February 1, 1930, flowing 500 barrels daily of 45 gravity, light green, pipe line oil from sand at 3957-71 feet.

Edgerly

Houston.—Strange Oil Company's Reed 1 at Edgerly, Louisiana, has been completed as a producer at 3670 feet. It came in flowing 50 barrels oil daily, when one joint of screen had been set in the sand. The same company has set casing over an oil showing sand at 3710 feet in Burton-Koonce 1.

El Dorado, Arkansas.—H. L. Hunt, incorporated, of El Dorado, has bought approximately 620 acres of land in the Cartersville-Sarepta oil field of Bossier and Webster Parishes, Louisiana, from Atlantic Oil Producing Company for a consideration of $35,000 cash, it was learned from semi-official sources. The acreage is situated in Section 1-22-11, Section 19, 29 and 30-23-11, and in Section 13, 25, and 34-23-12.

Parkersburg pioneers

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News From California Fields

BRAD MILLS, *Staff Representative, Los Angeles, California*

Gas Law Constitutionality Vigerously Attacked

LOS ANGELES.—The state's battle to force Santa Fe Springs operators to refrain from wasting natural gas was re-newed in Superior Court at Los Angeles, and after certain defense attorneys had argued all week on the validity of the law, Judge Hazlett adjourned court until February 13, in order that he might have a chance to review some of the dozens of citations. Attorneys for certain defendants immediately questioned the constitutionality of the statute and were unable to conclude their arguments and citations during the five-day period. The State of California is asking for an injunction to stop the unreasonable waste of gas, the case having been started several months ago. Defendants obtained a writ of prohibition from the district court of appeals and stopped the case last fall, claiming that lessors should be brought in as necessary parties. the state supreme court took the case from the jurisdiction of the lower court, finally deciding that lessors are not necessary parties and ordering the case back to trial in the superior court.

Walter F. Haas, attorney for Bellview Oil Company, vigorously attacked the constitutionality of the law. He discussed the decision of the supreme court, claiming there was an inference that the object of the law was not to stop gas waste but to curtail oil production. He argued that when the gas had helped to propel the oil to the surface, it had served its most useful purpose. Haas said the famous Indiana case affected dry gas production and not get gas produced with oil, as is the case at Santa Fe Springs. The state owns no land in the field and has no right to exercise proprietary measures over the operators, he stated. He said that there was much clamor going around concerning conservation, but the court naturally would not be affected by this agitation. Haas said that if the law was aimed at overproduction of oil, why should it not have been directed openly at oil? He further claimed that the state has no exact way of determining the best methods of producing the wells and advanced the theory that these engineers may even disagree among themselves.

After James S. Bennett, attorney for the state, has concluded his argument, Judge Hazlett will take the matter under advisement. If the presiding judge decides the law is constitutional, the case will be continued. The question of a temporary injunction will be considered, although it is believed that actual evidence will be heard before action is taken. It may require several more weeks to finish the case.

Organize Both Sides In Kettleman Curtailment

Los Angeles.—Kettleman Hills operators will meet in Los Angeles February 12 to appoint a board of directors, the original committee appointed last year having decided that this action will assure an equitable representation in the formulation of a plan of orderly development of this field. Completion of Petroleum Securities Company's Felix 1 has paved the way for drilling of additional offsets, and the possible subsequent development of the entire north dome unless another agreement is reached. Two plans are being considered for a limited drilling of the north dome. One calls for a straight unit form of development, while another provides for a zoning scheme. Either plan could be made workable, engineers believe, but no definite action can be taken until a permanent organization is formed.

Land owners in the field are organizing to hold curtailment measures in check, agreeing on a slogan, "Conservation, but not to the extent of paralysis." The city of Coalinga is favorable to the development of the field at this time and has informed the government of its stand.

Secretary Wilbur of the Department of the Interior has urged land owners to agree to some form of conservation, claiming that it will be better to produce the oil over a long period than to flood the market.

North Dome Principal Area At Kettleman Hills

COALINGA, California.—Unfavorable developments on the South and Middle Domes at Kettleman Hills make the North Dome stand out as the chief factor to consider. The belief that the South Dome will not produce at all and that the Middle Dome will produce gas and a limited amount of oil is growing, but drilling has not been extensive enough to warrant such conclusions. The theory that the South Dome has a connection with the Lost Hills field has also been advanced and if such proves to be the case the production map on this end of the structure may be changed.

Ohio Oil Company is still on the trail of production in Smith 1, a deep South Dome test, but has not been rewarded for its persistency. The well has been swabbed at various levels, but a small flow of gas has been the most favorable indication thus far. The well was drilled to 8054 feet but plugged back to test upper showings. Failure of this well will not condemn the South Dome, but it certainly will intimidate other operators who are expecting to drill after all restrictions are removed.

George F. Getty probably will abandon Erwin 1, located on the flank of the Middle Dome, after drilling the test to 6610 feet. Failure of this well is not particularly significant as it is more than one mile north of the axis.

Bolsa Chica Oil Corporation has been unable to make a producer of Ferguson 1, regarded several months ago as a favorably located test on the North Dome, continued swabbing having failed to bring results. There was some question whether the Temblor sand was found around 7250 feet. The well was drilled to 7480 feet, after cementing a string of nine-inch casing at 7275 feet.

Chanslor-Canfield Midway Oil Company, suspicious of results in Ohio Oil Company's Smith 1, has shut down Sahlein 1 at 6130 feet. This South Dome test has found about the same formations as were logged in Smith 1.

Petroleum Securities Company is still producing Felix 1, recently completed on the North Dome, despite the loss of a large natural gasoline plant which had been taking the wet gas. The well was not damaged by the blast which wrecked the plant and the gas flow has been diverted into the air.

After producing without interruption for more than 15 months, Milham Exploration Company's Elliott 1, discovery well, is still flowing more than 3000 barrels of 60.4 gravity oil and about 85 million cubic feet of gas. The well has produced more than one and one-half million barrels of oil and 45 billion cubic feet of gas since its completion in October, 1928.

Continental Oil Company's Elliott 12-8, an indirect offset to the discovery well, is producing about 5700 barrels of 61 gravity and about 160 million cubic feet of gas, the flow in this well having shown a slightly more rapid decline than expected.

Ohio Oil Company's Smith 1 is located in the southwest corner of Section 35-24-19. It has reached a total depth of 8046

feet. A showing of oil just below 6690 feet was tested but this lacked sufficient "kick" to make a producer. The well was drilled ahead without further showings, thereby giving rise to the theory that little should be expected of the entire South Dome.

South Dome

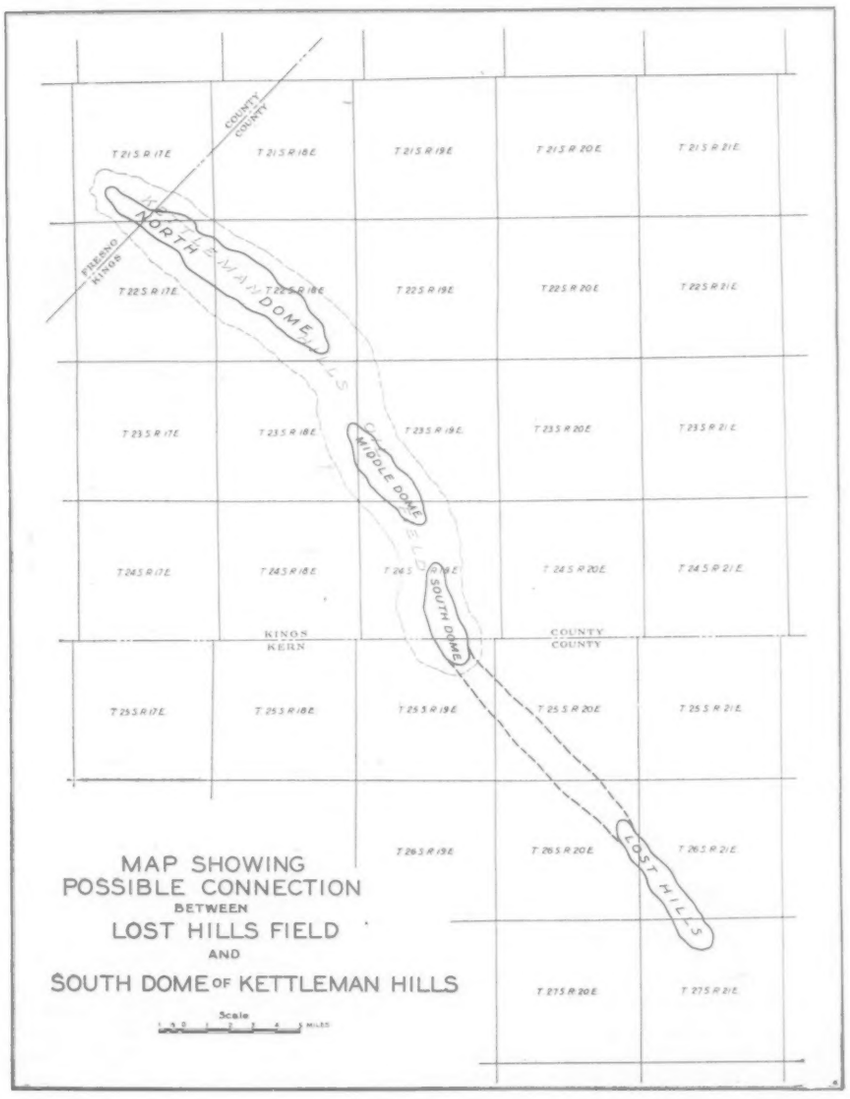
The South Dome is considered that portion of Kettleman Hills below Avenal Gap. The rocks here only show a nose plunging to the northwest. They are planed off by erosion south of the North Kern County line and there is no evidence in a southerly direction until the north end of the Lost Hills oil field is reached.

The only tangible evidence of a southern closure for the South Dome is the southern plunge of the Lost Hills field. A contour of the oil zone in this field indicates a southern plunge of the Pliocene rocks from Section 13-26-20 to and including Section 9-27-21, a distance of approximately 5½ miles. This is a greater plunge than that visible on the north end of this dome. It is therefore possible that this plunge may be the southern closure of the South Dome.

This view is modified by some geologists who place the closure on the south, anywhere from a few miles south of Ohio Oil Company's Smith 1 to the north end of the Lost Hills field. Core drillers and geophysicists are now attempting to carry out a cooperative scheme to prove the location of this closure.

Wherever the closure is located, it seems reasonable to believe that Ohio Oil Company's Smith 1 is on the northern plunge and the South Dome must contain oil higher inside the closure. Should the southern closure be the south plunge of the Lost Hills field, the crest of the dome should be approximately at, or just north of the north end of Lost Hills. Wells drilled in this area so far have reached depths of only 3600 feet and are finished in the shales of the Miocene. These wells did show considerable oil in the shales, which is further evidence supporting the above view.

Recent developments in the North Belridge field to the south indicate that the lower Miocene or Temblor sands there contain oil. This is the same sand that produces on the North Dome at Kettleman Hills. Therefore, the South Dome should contain production if its correct location can be determined and if it is within reach of the drill.



Santa Fe Springs Drilling Continues Active

Los Angeles.—Interest in field development has been overshadowed by curtailment, at Santa Fe Springs, but a recent survey shows 165 active drilling wells and about a dozen O'Connell zone producers to be killed for deepening to the Clarke zone. Peak of production in the Clarke zone has not been reached, but a tapering off in the number of drilling operations is expected. Four wells are drilling above the Meyer zone, 42 between the Meyer shutoff and the O'Connell zone, 53 between the O'Connell shutoff and the Clarke zone and 66 below the Clarke shutoff. The last figure shows the large number of wells about to be completed. A peak should be reached within two weeks, with 380,000 barrels the approximate figure.

The smaller initial production of Clarke zone completions has resulted in a small margin between the decline and total new production. This small differential indicates that the peak will soon be reached and a steady decline started.

Efforts to develop production in the bottom of the Clarke sand has met with little success. Like all other zones, the top of this formation has produced most satisfactorily.

The Hathaway zone, discovered by Oscar Howard in Hathaway 7, may prove to be a factor, but there is yet no positive evidence that this 9000-foot formation will cause any trouble. Hathaway 7 has again been recemented and will be tested between the 4¾-inch shutoff at 8737 feet and the top of the plug at 8950 feet.

Average initial production of Clarke zone completions was a scant 1000 barrels, but most of the new wells were finished on edge leases.

Ellwood Boundary

Los Angeles.—Department of the Interior has upheld the original boundary line of the Barnsdall Oil Company—Rio Grande Oil Company's leases in the Ellwood field, holding that the south boundary of the Dos Pueblos Rancho is the Pacific Ocean and not some line inland from the mean high tide line. These companies were sued by E. W. Lloyd and others, who claimed that the original boundary line and the subsequent oil and gas lease line did not reach to the mean high tide line. They contended that an additional lease should be granted for the strip fronting the field and questioned the littoral rights of the oil companies to this land.

San Francisco, Calif.—The government has dropped the investigation of alleged oil and gasoline price fixing agreements between principal California companies, but a comprehensive suit in equity will be filed for enjoining certain alleged unlawful practices, according to special assistants to Attorney General Mitchell. The grand jury investigation was regarded in oil circles as unjustified.

News From Rocky Mountain Fields

Government Policy Restricted Development During 1929

FROM the best information available at this early date there were 609 wells drilled for oil and gas in the Rocky Mountain region in 1929. Of this number 269 were oil wells and 83 were gas wells. The dry holes and abandonments totaled 237. The 269 oil wells developed an initial daily production of 50,600 barrels. Wyoming led in initial output with 23,000 barrels from 74 new wells, New Mexico was second with 18,000 barrels from 69 new wells while Montana had 7400 barrels from 109 wells and Colorado had 2200 barrels from 17 wells. The 83 gas wells had a total maximum open daily initial flow of approximately 1,500,000,000 cubic feet.

States—	Completions	Oil Wells	Gas Wells	Dry Holes	New Oil Production
Montana	224	109	34	81	7,400
Wyoming	135	74	17	44	23,000
Colorado	97	17	18	62	2,200
New Mexico	133	69	14	50	18,000
Utah	8	0	0	8	...
Idaho	2	0	0	2	...
North Dakota	2	0	0	2	...
South Dakota	3	0	0	3	...
Arizona	3	0	0	3	...
Nebraska	2	0	0	2	...
Total	609	269	83	257	50,600

The Hoover-Wilbur conservation policy put a crimp in drilling operations in the Rocky Mountain states in 1929. At the beginning of the year, it looked like it would be a banner year for development work in all the states of the division but just at the time of the year when oil and gas companies generally start active drilling campaigns, the administration issued its edict of March 12 rejecting all applications pending for prospectors' permits to drill for oil or gas on the public domain and announcing that no more new permits would be received. This policy has prevented much new work outlined at the beginning of the year. Unless there is a further modification of the administration's policy, the refineries in this division will have to import part of their crude requirements before another year.

Gas Activity

While the oil exploration work in a measure lagged behind other years, there was very great activity in the natural gas industry with a major system being completed from southern Wyoming and northern Colorado to Salt Lake, Utah. This system cost in the neighborhood of $20,000,000. It is now being extended into southern Idaho with the possibility of further extension another year. Montana, Colorado and New Mexico were each active in the expansion of the natural gas industry with probably the expenditure of another $20,000,000 in the aggregate.

The following table reviews the development work in the Rocky Mountain region in 1929:

To the number of completions must be added those in several other states in the Rocky Mountain region in which drilling operations have been carried on for several years. Utah again was unsuccessful in finding oil and closed the year with eight dry holes to her credit. Idaho, North Dakota and Western Nebraska each had two dry holes and South Dakota and Arizona each had three dry holes, making a total in these states of 20 completions which added to the 589 in Montana, Wyoming, Colorado and New Mexico makes a grand total of 609 in all states for the year.

The completions were about in the ratio of 40 per cent in proved fields and 60 per cent in wildcat drilling. Wildcat work was speeded up to protect permits on the public domain which called for drilling obligations. As most of these permits have been either proved or disproved and most extensions of time have been granted with the stipulation that no drilling will be permitted until at least one year from date of extension, it is not likely there will be very much wildcat drilling in 1930.

Expansion of the natural gas industry in Montana somewhat overshadowed development work for oil in 1929. Ohio Oil Company connected its Dry Creek well in Big Horn County with its trunk line from Elk Basin to Billings. The discovery well is good for about 11,000,000 cubic feet of gas daily with a pressure of more than 1000 pounds. It is drilling a second well on the structure. There was an intensive drilling campaign in the southeastern part of the state to provide gas for the new lines into Southwestern South Dakota. There was also drilling in the different fields which supply gas to Shelby, Great Falls and towns in the northern part of the state. A new line was laid into Conrad.

While there were no new oil fields discovered in Montana in 1929, there was a rather intensive drilling campaign in the proven fields and there was a shortage of crude to supply the refinery capacity of the state. The Kevin-Sunburst field was extended in nearly all directions and the Pondera and Bannatyne fields, discovered last year, were further proved for both oil and gas production. An oil pipe line was laid from the Pondera field to Conrad, a distance of about 4½ miles.

At the close of the year 1929, one new refinery was under construction in Montana. It is being built at Laurel by Portland capital and will have an initial cost of $1,000,000. It will run on Oregon Basin crude and it is expected will be ready for operation next April.

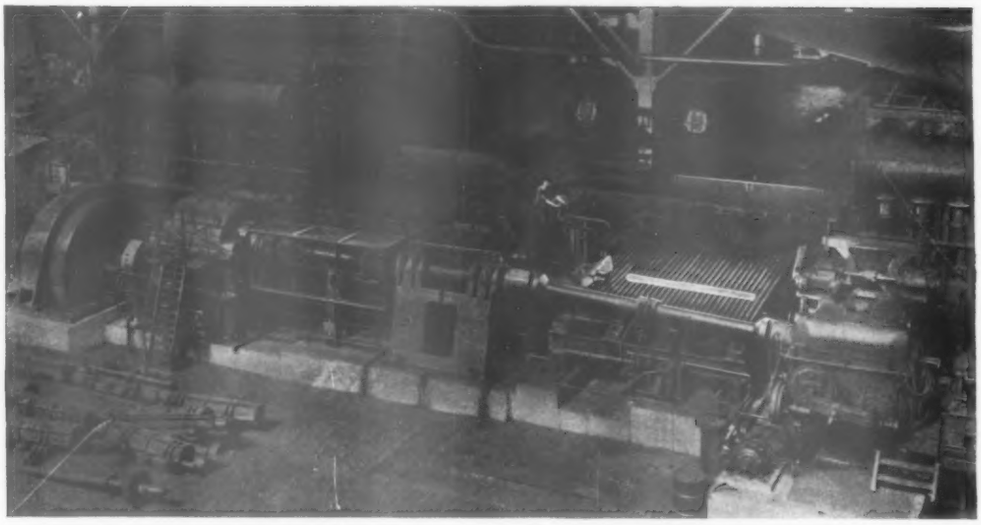
Wyoming

Drilling operations in Wyoming in 1929 resulted in the discovery of a 2500-barrel well in the Madison lime at Frannie. This was perhaps the most important discovery in the state within the year. Kinney-Coastal Oil Company brought in a gas well in the Pilot Butte shallow field in Fremont County that gauged 63,000,000 cubic feet of gas from 3263 feet. It is now being drilled deeper to test the Muddy sands for oil.

Deep tests were started in several fields in the year that are being closely watched. The most important of these is that of the Midwest Refining Company in the center of the Salt Creek field. It has developed 5000 barrels in the third Sundance sand but will be carried to the granite for a test of the Embar, Tensleep, Amsden, Morrison and Deadwood. It is expected that all of these sands will be reached inside of 5500 feet. At Lance Creek, Ohio Oil Company has a test under way for the Sundance and may carry it down to the Pennsylvanian, at Mule Creek. Argo Oil Company drilled to the Sundance and Embar and found water and is going on down to the Madison and Deadwood. Notches will be deepened in the year to the Madison. An important test will be started soon east of Casper on an anticline on which there are three pronounced structures, Midway, Middle Geary and Geary domes. Interests identified with the Midwest Refining Company will furnish the money and Midwest will do the drilling.

While there has been large expenditure for refinery betterment in Wyoming within the year there have been no major

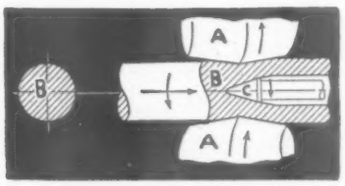
(Continued on page 96)



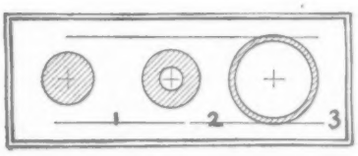
Pictured above is the first piercer in the J & L No. 2 Seamless Tube Mill at the Aliquippa, Pa., Works. One of the solid round billets, white hot, from which J & L Seamless Pipe is made, may be seen rolling down the skids, to enter the machinery in the right foreground, to be converted into tubular form. Compare the size of this powerful machinery with the operator, at his controls, in the center of the picture.

Right from the Start

J & L Strives for Seamless of Uniform Wall Thickness

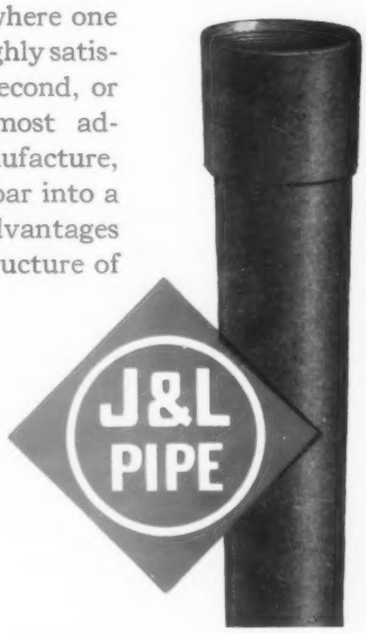


Sketch shows in cut-a-way view, the operation of the first piercer. The rolls, "A," carry the solid round billet, "B," over the piercing point, "C."



Development of cross section in the manufacture of J & L Seamless: 1. Before piercing; 2. After first piercing; 3. After second piercing.

IN producing all sizes of Seamless Pipe, except the smaller tubing where one piercing operation is thoroughly satisfactory, J & L employs also a second, or expanding, piercer. By this most advanced method of seamless manufacture, J & L converts the solid round bar into a tube gradually and easily. Advantages are, absence of strains in the structure of the steel and production of a tube of relatively uniform wall thickness right at the start. Together, these results make for uniform strength and dependability in the finished J & L Seamless when it goes into service in the field.



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New Oil Field Opened on Montana-Alberta Border

Shelby, Montana.—An international oil field has been discovered between Montana and Alberta, Canada. It was proved in the last week by a third well which came in from the Sunburst sand with a flow of 10,000,000 cubic feet of gas and 5000 barrels of fluid of which about 400 barrels are oil. The other two wells were brought in producing from the Ellis sand, found about 70 feet below the Sunburst. Still larger production is anticipated when the new well has been deepened to the Ellis horizon. The new well is the property of the Cosmos Oil Company, Thacker 1, Section 2-37n-4w, and is bottomed in the Sunburst at 2418 feet. The sand was topped at 2410 feet and drilling has been suspended awaiting the erection of additional storage. The new field is seven miles west of the towns of Coutts on the Alberta side of the international line and Sweet Grass on the American side. Surveys have been made by two companies for pipe line outlets. Illinois Pipe Line Company has made a survey to Sweet Grass and Maple Leaf Refining Company has made a survey from the field to its refinery at Coutts and established a price of $2 a barrel at the refinery. The oil tests 31.5 A. P. I. gravity. The new field has not been definitely named and is variously known as Buckley Dome, Blarney Castle Dome and Red Coulee.

Canadian Deposit

Denver, Colorado. — A syndicate of Denver and Mid-Continent operators, headed by Max W. Ball, is being organized to develop the tar sand of the Athabasca district in Alberta, Canada. These sands have an almost unlimited supply of bituminous products which it is claimed can be recovered at a cost to compete with well petroleum.

Conservation Board Gets Appropriation Extended

Washington, D. C.—An appropriation of $17,220 for use by the Federal Oil Conservation Board during the fiscal year beginning July 1, next, has been provided by the house appropriations committee in the independent offices appropriation bill, reported to the house February 5. This was a reduction of $5000 from the budget estimate of $22,220, but the reduction was not made in order to reduce the board's activities but because for the past five years the board's annual expenditures have been only $10,000, and the committee felt that it would not be handicapped by not having the full amount available that it asked for.

The board was instituted by President Coolidge in 1924, and in 1925 an appropriation of $50,000 was made for its expenses. There has been no new appropriations since that time, but congress has from year to year re-appropriated the unexpended balances of the initial fund.

One of the objects of the board, the appropriations committee was told by Edward C. Finney, solicitor for the Interior Department and chairman of the Interior Department oil committee, is to secure, as nearly as possible, uniform legislation for the conservation of oil and gas, and also measures, if possible, in times of over-production to limit to some extent the production of oil. The board also proposes to study conservation and use of oil and gas resources, and also the foreign oil production, particularly the question of imports of oil as affecting American interests. It is felt, therefore, that the board has still quite a great amount of work to perform.

Recommendations of the board have already been put into effect in some of the states, New Mexico last year passing an act modeled on the board's recommendations, while California adopted a bill for the conservation of gas. The work of the commission has been very useful, Mr. Finney declared, but it will be necessary to go on for another year or two in order to accomplish the final results which have been sought for the past five years.

Rincon Wildcat

Ventura, Calif. — General Petroleum Corporation has found the top of the Miley shale zone at 2550 feet in Ferguson 1, an important test located on a pier 1800 feet out in the Pacific Ocean and offsetting the small producers in the Rincon field, and is cementing a string of 13⅜-inch casing to test the formation lying just below the proposed shutoff. The few cores taken after the shale marker was found showed oil and gas and it may be possible to make a commercial producer from as little as 25 feet of zone. This well was located after an extensive submarine survey of the ocean bottom by divers and is believed to be on a small structure lying entirely in the ocean. Top of the shale was found more than 300 feet shallower than in Rincon wells, but some geologists believe there is a direct connection between the zone and the one producing in the Rincon field. Completion of a good well at this point in the ocean would result in additional drilling on tideland permits.

Buttonwillow

Bakersfield, Calif. — Milham Exploration Company has started four wells in the Buttonwillow district, the principal objective being to develop a larger gas production. All of these new wells are located on Section 5-28-23. The company is trying to develop oil production below the gas sand in Kern 6, now being tested at 4945 feet, and if successful the new wells will be carried to the deeper sand. General Petroleum Corporation has entered the district, locating a well on Section 6-28-23. Recent completion of a large gas line to connect this field with the Kettleman Hills-San Francisco trunk line has been the direct cause of increased activity.

California Operators Plan Cut to 600,000 Barrels
(Continued from page 29)

various fields. This meeting should serve as a barometer and unfavorable action will aggravate the price structure.

As long as Santa Fe Springs holds the key to the situation, this field will be watched closely. Production is running around 163,000 barrels and has averaged considerably higher since January 1.

Fields affected by the statewide plans are, besides Santa Fe Springs, Long Beach, Elwood, Ventura and Seal Beach; Maricopa Flats, Kern Front, Round Mountain and Mount Poso. Nearly all other large fields are being considered in the general scheme and curtailment may become effective in other active areas. Tentative plans for reducing the output of all flush and semi-flush fields in the Los Angeles basin, San Joaquin valley and Coastal district have been drawn, but a definite cut has not been decided upon.

Production at Santa Fe Springs may not be reduced to a figure below 150,000 barrels at this time, but the output will have to be held to the designated figure and no quibbling allowed. Long Beach may be allowed a flat 100,000 barrels, but a slopping over of a few thousand barrels will nullify the benefits to be derived from a strictly cooperative plan.

Potential production of California is fully one million barrels and if the lid is thrown off both this district and the Mid-Continent will suffer from the increased flood. Storage is about full in the state and an outlet would be found for the surplus, even if other markets were to be weakened. There is little room for more gasoline, and certainly an increased production would result in increased refinery runs. This in turn would make additional outlets necessary and a generally weaker market structure for the entire country.

Much has been said concerning shipments of California gasoline through the Panama Canal to points along the Atlantic seaboard. These shipments during 1930 will depend largely upon crude production within the state. As previously pointed out, tanks suitable for holding gasoline are limited in California and a larger surplus is not desired. The state has been increasing its outlets for several years, and it will be recalled that it was during 1923 and 1924 that this first great expansion movement began. Obviously, it was caused by over-production.

The present movement to bring production to a reasonable level is the direct outgrowth of failure of various moves in the past. The voluntary curtailment program placed in effect last year was caused by a radical reduction in crude prices. It is feared that if oil is produced without restraint and crude prices topple, a recovery will not be staged under one year.

Louisiana--Arkansas Field Notes

Zwolle Extension Area Producer Flows 40 Barrels Hour

SHREVEPORT, La.—The main interest in this territory during the last week was divided between the Zwolle field of Sabine Parish, and the testing of a wildcat in Claiborne Parish, Louisiana, 18 miles southeast of the old Homer oil field.

Amerada Petroleum Corporation had 600 feet of oil standing in the hole of Bowman-Hicks 1, SE NE Section 33-8-12, three-fourths of a mile northwest of Benedum & Trees' Bowman-Hicks A-1, Section 34-8-12, Monday. The well swabbed and bailed 30 barrels of oil Sunday, February 9. Total depth is 2455 feet, chalk rock having been encountered at 2430 feet. Surface elevation is 269 feet. Six and five-eighths-inch casing was set at 2333 feet.

This gives the eastern extension of the Zwolle field a producer three-fourths of a mile northeast and also the same distance northwest from the 12-mile extension well which was completed in chalk rock at 2413 feet last November 26, as Ohio Oil Company's Bowman-Hicks 1, SW NW Section 35-8-12, was placed on the beam February 10, after having made several heads of oil during standardization. Total depth of the latter well is 2405 feet. The chalk rock was topped at 2392 feet with surface elevation of 307 feet.

Triangle Drilling Company used the siphon method of testing a granular lime formation encountered at 4371 feet in Kilpatrick 1, Section 7-19-5w, Claiborne Parish, Sugar Creek district. The well, whose core had shown traces of light oil, tested slightly over one million cubic feet of gas rich in gasoline content. It was decided to go deeper and coring is now under way. Nine-inch casing had been set before the lime formation with a gas show encountered, at a depth of 4266 feet. The goal of the test had been a horizon at 4500-4600 feet, which had shown oil in a previous nearby test. It is possible that if nothing of commercial value is encountered at this level or above, that the hole will be drilled to the lower Trinity formation. The formations are checking 300 to 400 feet higher than at Cotton Valley, where Magnolia Petroleum Company recently abandoned McCook and Hibbler 1, Section 22-21-10 at 7006 feet, after having cored a rich oil sand from 6947 to 6958 feet.

The gas show indicated both oil and gas potentialities in the Glen Rose formation. The gas is now being analyzed. A superficial examination indicated it is of about the richness of the Cotton Valley upper Trinity gas in gasoline, which is about one and a half gallons per thousand cubic feet.

Shreveport, Louisiana.—Ohio Oil Company's Bowman-Hicks 2, SE SW Section 33-8-12, a mile west and slightly south of Benedum and Trees Bowman-Hicks A-1, Section 34-8-12, the 12-mile northeastern extension well of the Zwolle, Sabine Parish, Louisiana, field, was turned into tanks late Tuesday and flowed 40 barrels the first hour. Total depth is 2510 feet in chalk rock, this formation having been picked up low at 2500 feet after 6⅝-inch casing was set at 2360 feet.

R. L. Gay, Trustee's Bowman-Hicks 1, Section 14-7-14, discovery well of the older Zwolle field, completed Thanksgiving day, 1928, flowing 50 barrels daily, has been put on the beam pumping 210 barrels. Total depth is 2130 feet in sand just above the chalk rock being the only sand producing well in Zwolle.

Muslow Oil Company's Kilgore B-1, SE NW Section 31-23-11, Bossier Parish, Cartersville District, blew in late Tuesday making an ungaged amount of gas. Four and half-inch casing was set at 3134 feet with 20 feet of sand.

Lide and associates' Sabine Lumber Company 1, SW SW Section 31-8-12, three miles west of the Benedum & Trees extension well, and located in the outskirts of the town of Zwolle, are drilling in, having set six-inch casing at a depth of 2182 feet. If this well is a producer it will strengthen the theory that this is all part of one field and not two separate fields, as some have believed.

Haynes Brothers, who topped the chalk rock at 2288 feet and set 6⅝-inch casing at that level with total depth of 2316 feet in Meyer 1, Section 28-8-12, have built standard rig and are drilling in with cable tools.

Ohio Oil Company found the chalk rock formation running low to the west of the extension producer, its Bowman-Hicks 2, SE SW Section 33-8-12, having gone to 2500 feet before picking up this formation.

Three locations were made during the week in Zwolle. Benedum & Trees have derrick pattern for Bowman-Hicks A-3, an eastern offset to the extension well, which is in NW SE Section 34-8-12. Ruston Drilling Company made its third location in Bowman-Hicks A-2, Section 35-8-12, where derrick pattern has been laid. G. M. Le Grand, who has been shut down in Haley 1, Section 6-7-12, in the outskirts of Zwolle, after setting 6⅝-inch casing at 2130 feet, due to legal entanglements, has taken out permit for Giaque 1 in the same section and is reported ready to drill in the Haley test.

Benedum & Trees' Bowman-Hicks A-2, Section 3-7-12, a half mile south of the extension well, is coring at 2282 feet to pick up the chalk rock.

The Cartersville-Sarepta field of Bossier and Webster Parishes, which has been hard hit by bad weather and bad roads, received two new locations during the week, Natural Gas Production Company's U. S. 3 and 4, both in Section 31-23-11, where there are four producers making oil below a depth of 3150 feet.

Besides the new tests for Zwolle and Cartersville-Sarepta there were six other locations made in North Louisiana, one of which is for a wildcat test in the southern part of Caddo Parish.

Arkansas

Interest in South Arkansas continues to be centered in the new Urbana field of Union County, where Marine Oil Company recently completed the deepest oil producer in that state, Thompson A-3, Section 10-18-13, at a depth of 3535 feet, probably in the upper Trinity or at a contact of that formation with the Woodbine.

Four feet more has been made in the hole and the yield by swabbing and bailing was increased to 560 barrels daily, 14 per cent salt water and basic sediment. No new locations have been made there in addition to the four reported a week ago, but Johnson and Gummer are arranging to deepen Cargile 1, SE NW Section 4-18-13, which was abandoned several months ago at 3341 feet.

Another abandoned hole which is being deepened is Buck 1, Section 7-15-17, two and a half miles northeast of the producers in the Mount Holly district of Ouachita County. This test was drilled to 2605 feet by Flaucher and associates and abandoned. Anderson and Winner have taken over the operation and are rigging up to go deeper.

The Use of Hydraulic Cement *In* Oil Wells

By J. B. CASE
Chief Deputy Supervisor, Department of Petroleum and Gas, California

EFFICIENCY in oil field development is the production of oil free from water for the longest possible time and in a manner to recover the greatest ultimate quantity from the underlying pool. Any conditions that prevent the accomplishment of this and which can be remedied are out of harmony with recognized principles of proper oil field practice, and are detrimental to the best financial interests of the operator and landowner. Infiltration of water into the oil-bearing sands and dissipation of oil and gas into formations of lower pressure than that of the formations producing them prevent the recovery of the greatest amount of oil possible and therefore represent forms of waste which must be overcome if waste is to be minimized. Individual wells, leases, and fields, are alike subject to waste from these two causes. The total waste from these two causes has not been appreciated by many operators, but it is doubtless enormous, and it is important that a careful study be made of successful methods of preventing waste from these two causes and the methods put into practice.

Just as oil producers have come to recognize the great value of gas associated with the oil, through taking advantage of its energy and turning into an asset what a few years ago was considered a liability, so will there be improvement in other phases of development and production. One of these now receiving consideration and study is improvement in the manner of using cement in that portion of a well below the water string.

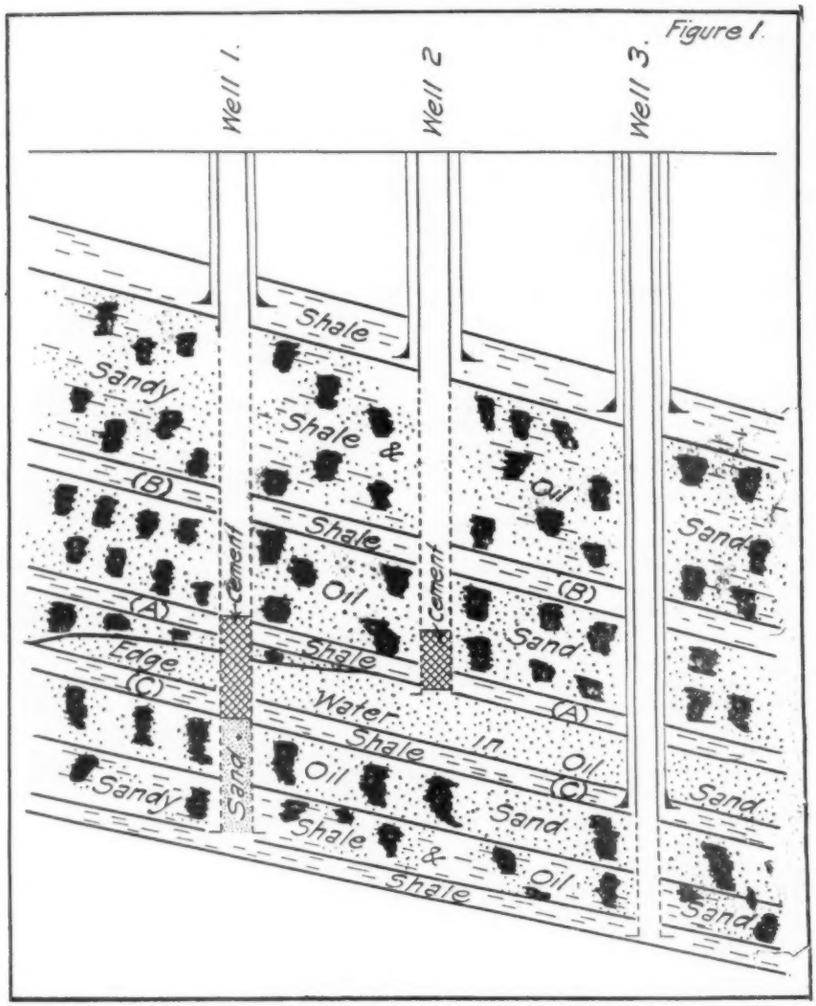
Keeping water out of the oil sands and preventing the dissipation of oil and gas underground require the most careful and particular work encountered in the oil fields. Thoroughness, accuracy, and skill are necessary in the performance of the work, if the desired results are to be obtained, and it is essential that complete data and records be made on each operation to be used in the development of new and efficient methods and reduce the chances of failure.

The detrimental effect of infiltrating water on the production of oil is well known to every operator. An accelerated decline and end of profitable production follow when water, from whatever source, is not properly excluded from the well. The loss of oil trapped in the sands, due to the spreading of infiltrating water or the rapid and irregular encroachment of edgewater, is tremendous, and is very evident when recoveries from "wet" and "dry" portions of a field are compared. Jobs of combatting water troubles are not occasional, but arise in nearly every well sooner or later. The problems and attendant difficulties increase with the age of the well.

The exclusion of water, everlying the oil sands to be produced, is probably easier to accomplish than the exclusion of either intermediate or bottom water. Definite tests can be made to determine the effectiveness of a top water shut-off, but in the case of intermediate or bottom water, it is usually necessary to determine the result by testing the subsequent production or by observing the effect on neighboring wells. Even though it should become necessary to include some oil sand together with water behind casing, adequate protection of the oil sand against infiltrating water can be afforded by proper and thorough work.

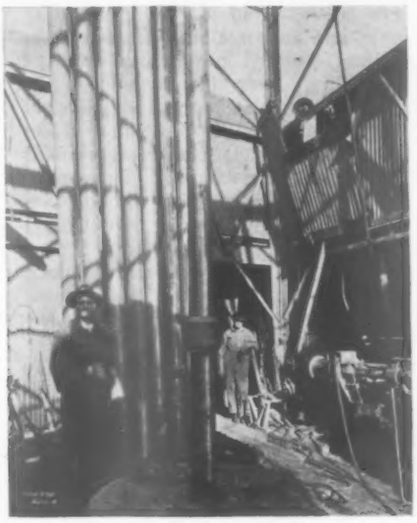
The exclusion of water within an oil zone from the producing sands is generally more difficult, and success is far less certain, than in the case of top water. Usually the oil string is in the hole and the cement must be placed through it to the desired point on the outside between the casing and the formation walls. Determination of the exact source of the water and placing the cement in position to confine the water to its source are two

Figure 1.



Hypothetical oil zone, illustrating methods of excluding water from wells

View of Bettis Drill Stabilizer installed on a flush drill pipe used in a California field. The Stabilizers may be easily installed in the same manner as Bettis Protectors. Ask for descriptive folder.



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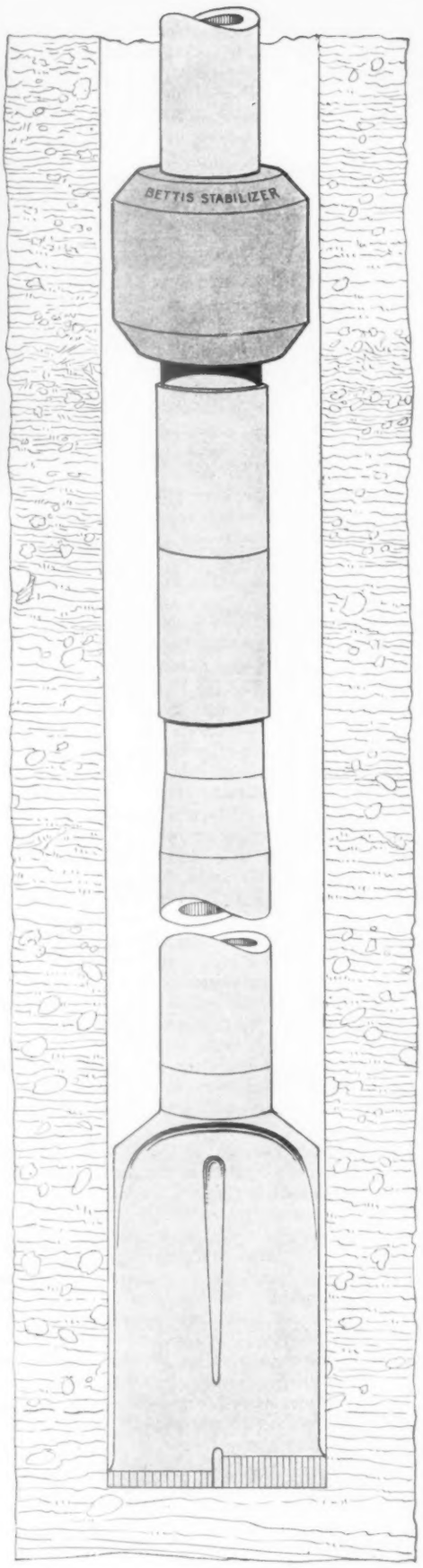

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of the difficulties encountered. When such operations have been performed without beneficial results, many operators, because of the uncertainties involved, are prone to overlook the value and necessity of repeating the work until results have been obtained.

Well No. 2, Figure 1, represents a well drilled just into an intermediate edgewater and in which top water is effectively shut off. Suppose a cement plug is placed in the shale bed (A) to prevent the intermediate water from having access to the overlying oil sand. Efficiency demands that no water shall be present when the top of the cement plug is not higher than the top of the shale bed (A). However, many operators use cement enough to reach higher than the top of (A). Unless the cement above (A) is removed the well might produce clean oil while water from below might also be spreading into the lowest portion of the oil sand. A test of the result of plugging is actually indefinite under those conditions.

When a plug is brought up higher than it should be, due to the use of too much cement, it should be removed to the point where no oil sand above the water is plugged off with the water. If the well is wet after placing the plug, the cement should be removed and the job repeated until it is effective. Sometimes the condition of the hole can be improved so that the cement will have a better chance to get into place and bond properly with the formation walls and form a complete seal. To continue plugging on top of a cement plug which fails to exclude lower water only makes conditions in the area worse. However, this is very frequently done, and little consideration is given to the effect it may have on surrounding wells.

In well No. 2, Figure 1, the top of the first plug is somewhere in the oil sand above shale (A), the well is still wet from the water below (A). If plugging is continued up through shale (B), where sufficient bonding takes place to prevent the water from having access to higher levels, water will not appear in the production from the well, but the well will continue a source of damage to productive oil measures and a menace to the area. The fact that a well is plugged for lower water, and produces clean oil thereafter, is not sufficient to warrant the assumption that the well is in a satisfactory condition. Many wells are probably in this condition without the owners' definite knowledge and with little possibility of obtaining sufficient evidence to justify requiring the work to be repeated until conditions can be shown to be satisfactory. The conditions exist because definite records have not been kept, or perhaps definite tests have not even been made. Proper engineering supervision would demand that cement plugs be placed at exactly the proper position under the most satisfactory conditions obtainable, and that cementing jobs be repeated until they are successful. The exclusion of water need not be entirely complete to be satisfactory. A small amount of water getting by a plug can be produced with the oil. No damage to the oil measures will ensue if the water is removed as rapidly as it enters the hole and is not permitted to head up and infiltrate into the sand. Tubing must be placed low in such wells.

Until all plugging operations and remedial work are efficiently and correctly performed, there will be preventable waste in oil production. It must be recognized that stratigraphic uniformity of exclusion and control of water within the oil bearing horizon is just as important and fundamental as shutting off top water. It is this type of oil field work which needs more serious thought and consideration if operating losses in oil fields are to be minimized.

Segregation of Zones of Different Pressure

When sands of high and low gas pressure are encountered in thick oil zones, careful and uniform segregation should be made over the entire field, or at least over large areas in which conditions are similar. This would necessitate complete co-operation among operators, and could be accomplished if a careful and comprehensive analysis of conditions were prepared by the engineering department of each concern involved.

An application of the principle of segregating sands of different pressures is that of "stage development" of oil fields, in which the vertical footage to be opened to production in all wells is limited to an amount arrived at by agreement. Outstanding examples of this are found in the Dominguez and Inglewood fields.

In order to determine whether segregation of sands is advisable and necessary in a well, something must be known about the pressure and productivity of the individual oil sands or individual portions of an oil zone. Such necessary data can be secured only by proper tests being carried to definite conclusions. Many tests of this nature are stopped before anything definite has been ascertained. The control of operations on wells where tests are being conducted should be vested solely with the engineering departments of the various concerns so that adequate data may be obtained and the tests continued to definite conclusions. Several companies in California and elsewhere have recognized the necessity and value of this control by their respective engineering departments and have delegated the necessary authority to them on certain wells for specific purposes. This control is exercised through a co-operative working understanding between superintendents, foremen, and members of the engineering forces.

A "wet" well presents two problems to the operator: First, the problem of definitely locating the source or sources of the water; and, second, the method of excluding or controlling the water. Similarly "thief sands" present two problems: First, the location of the low pressure sands; and, second, the best method of segregation and production of both high and low pressure portions of a zone without undue loss of production from either.

The necessary data relative to the source or sources of water, or the segregation of high and low pressure portions of zones, must be obtained for intelligent procedure. The securing of this data is best assured by co-operation, not only between interested companies but between the various departments of each company. With this necessary data at hand, the actual performance of remedial work should be started at the earliest possible moment.

Hydraulic cement has long been recognized as the most suitable material for use in oil wells to exclude water from oil-bearing formations. Further, when movement of fluid around the shoe of a string of casing into the hole is prevented by its use, it insures the permanent efficiency of mud fluid in confining oil, gas, and water, to their respective strata behind water strings. It is likewise the most suitable material for forming an impervious barrier between porous formations, as a substitute for the original impervious shale, when the bore hole is to be closed, or when it is desired to segregate the formations penetrated below the last water string. While the operation of placing the cement is principally mechanical, requiring a great deal of skilful manupulation, it also has technical and engineering features. It is noticeable, from a resume of records extending over several years, how much more efficient the results are under technical supervision. Nearly every operating concern of importance now requires one of its engineers to be present at every cementing job. The tool pusher or driller who has the mechanical work to perform, regardless of how competent he may be, can not be expected to anticipate and check all preparatory steps and calculations and make a record of all the details of the job, so important for future reference should additional work be necessary in the well.

Effective, intelligent, remedial work is practically impossible in rapidly developed congested fields where many wells have been improperly drilled and cased. In the great hurry to complete wells, inadequate tests have been made and erroneous conclusions drawn. Many of the tests have involved the use of cement plugs in determining the location of water. Because the cement has not been properly placed in the correct position in a well, and because tests often were not carried far enough to be conclusive, irreparable damage and waste have ensued. The standard of operations in fields of this kind has been extremely low, because of haste, competitive conditions, lack of engineering supervision and inexperience on the part of many operators. An inevitable result of improper drilling practice is the untimely appearance of water, possibly through the entire thickness of the oil measures, from cross-infiltration. All possible means should be utilized to safeguard the invested capital and to protect the deposits of oil and gas from damage and loss.

Repetition of Operations.

Failures of cementing jobs in connection with water strings, plugs, or for whatsoever purpose used, are experienced by every operator, without any evident cause so far as caution and workmanship are concerned. The failures are attributed largely to mechanical difficulties and adverse conditions interfering with the work of placing the cement. Doubtless other causes are responsible for some of the

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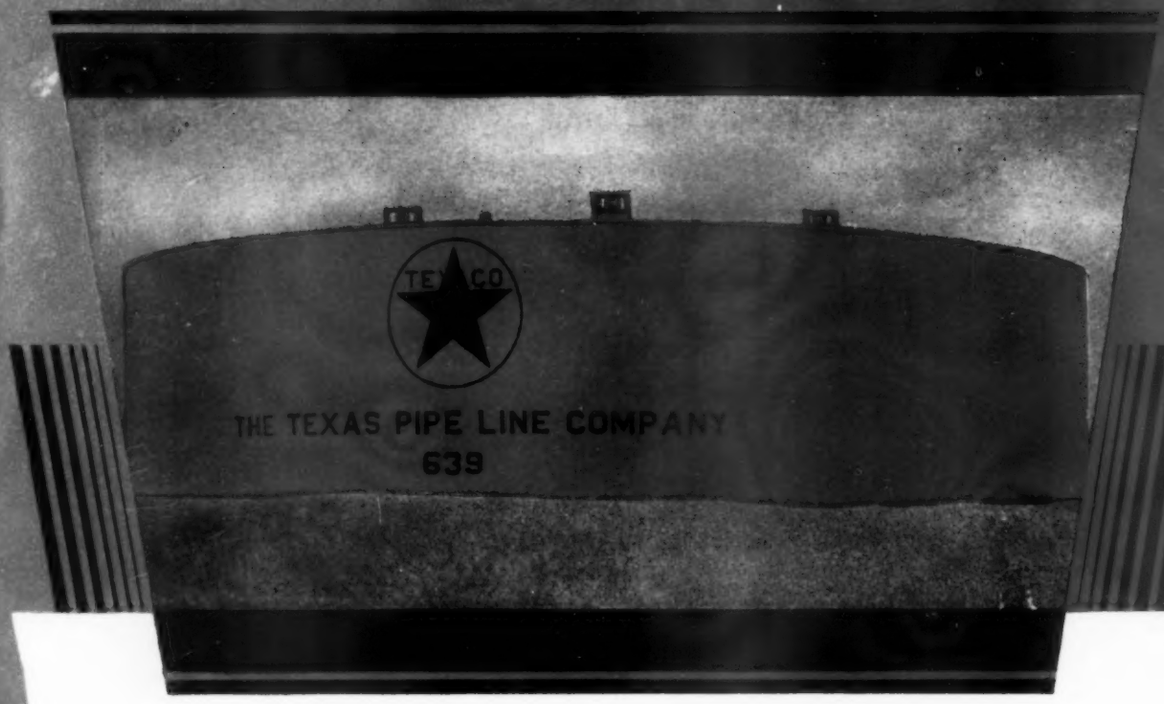

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failures which are not given due consideration. The important point in this connection, however, is that, when the necessity for the use of cement exists, the fact that it failed to accomplish the purpose does not eliminate that necessity. Therefore, when any cement job is a failure it should be done over until it is made successful. This point is too frequently disregarded. Many times the unwarranted conclusion is drawn that the water can not be plugged off or controlled, or that the water has already flooded the oil zone. This conclusion offers the line of least resistance to the concern whose standard of operations is low and leads to the necessity of additional work, either plugging to a higher level or deepening, leaving a condition in the hole which menaces the surrounding area, and which should have been remedied.

Quality of Cement.

There are some points on which the operator should be informed relative to the cement that is to be used in his well. He is interested in what brands of cement are giving the best results in the field. A constant quality product may reasonably be expected from cement plants, especially if their supply of raw products remains constant in quality. Demand and competition make it worth the effort and expense on the part of cement manufacturers to meet the needs of the industry. It is reasonable to assume that the cement industry itself is best qualified to produce a product adapted to oil well use. Good cement for oil well use is available, but whether it is good at the time it is used depends upon its age, how it has been stored, its care in transportation and whether it was manufactured for the purpose for which it is to be used.

Age of Cement.

The opinion is widespread throughout the oil industry that cement should be used as soon as possible after it is ground, termed "fresh cement." The time interval for cement to pass from the "fresh" state to the "old" state varies, depending upon many conditions. Some believe that any cement over forty-five days old has deteriorated to a degree to make it unfit to use in a well. Deterioration is due to sweating during transportation and storage. A careful operator takes precaution against any deterioration that may take place in cement carried in stock for any considerable time, by demanding cement just received from the plant. Oil companies buying directly from cement plants should limit purchase to their needs for very short periods of time and avoid having "old" cement in stock. Freshly manufactured cement should give the best results and an operator is justified in accepting only fresh cement.

Storage of Cement.

Cement should be stored in a cool, dry place. Each sack should bear its own weight only, and sacks should not be piled one on another. Pressure due to weight is considered injurious to the setting quality of the cement. Ample floor space should therefore be provided for storing it.

All cement handled by dealers is not intended by the manufacturer to be used in oil wells. Some dealers in the past have sold "structural" cement as "oil well" cement, but the purchaser should see that he is getting the kind desired. To insure the consumer against misrepresentation, several manufacturers are now using bags with a printed label showing the contents to be "oil well" cement. It has been suggested that this label should also show the date the bag was filled.

Each lot of cement to be used in an oil well should be purchased by a competent buyer who will look into all details about the age and storage conditions of the cement. Competent buying will prevent the salesman from unloading anything in stock and the operator from using poor material. As a further precaution the cement should be adequately tested just before it is used. The writer witnessed the condemnation of three hundred sacks of cement which had been hauled out to a well from the warehouse and the cementing operation was delayed until additional cement could be secured. This delay cost money, but to have used poor material, resulting in a wet job, would have been far more expensive. The many apparently minor details about cement and cement jobs should have the close attention of a competent engineer.

Lost Time on Recementing.

In the Seal Beach field the average number of days lost time, due to the necessity of recementing, for all recement jobs on water strings up to about June 1, 1928, was 17-7/12 days, divided among the three large operating companies in the southeastern portion of the field, as follows: Associated Oil Company, 14¾ days; Standard Oil Company of California, 21 days; Marland Oil Company of California, 17 days.

The longest time reported on any individual job was Associated Oil Company, 21 days; Standard Oil Company of California, 42 days; and Marland Oil Company of California, 60 days.

In recementing water strings in the Richfield field, the average number of days lost by Associated Oil Company was nine days.

To this cost of time must be added the cost of extra labor and material on each job, usually about 10 extra men and 100 sacks of cement, and the fee of the cementing company doing the work.

If complete records are kept, doubtless much valuable data could be gathered on various causes of failure of cement jobs. Cement jobs should be classified under headings showing the directing head of the operation, as: Special crew; company field superintendent; company engineer; or, merely, drilling crew. The cost of failing to have a directing head or engineer on such a job was well exemplified at a well in the Santa Fe Springs field. Because no one in authority was present when attempting to recement the water string, too large a quantity of cement was used, accelerator was added to the cement when it should not have been used for a job of this kind, and the tubing was cemented in the casing. The well was thereby put in such a mechanical condition that it seems hopeless to remedy a bad water condition which existed in it and which was the reason for the recementing operation.

Causes of Failure of Cement Jobs.

On most cement jobs the slurry going into the well is very non-uniform in character. The cement is fed into the mixing chamber as fast as it will pass through the orifice of a hopper, which is kept full until all the bags are emptied. The rate of feed is therefore practically constant throughout the interval of mixing, provided bridging in the hopper is prevented. The volume of water forced into the mixing chamber per unit of time varies considerably because the pressure pump runs faster or slower than an average speed. It has been observed that the speed of the pump slackens to about one-half normal when wet steam or a slug of water draws over from the boiler. At such a period, the percentage of water in the slurry is lowest, perhaps as low as forty per cent. When dry steam reaches the pump, it speeds up and the percentage of water in the slurry rises to a maximum, perhaps sixty per cent. or even higher. Thus the consistency of the slurry varies between high and low limits and goes into the well in thick batches and thin batches. If a thin batch happens to be passing out around the shoe when the cementing operation is completed, a failure may result from that particular cause. Excess water lowers the strength of the cement, increases its porosity, and very markedly lowers its resistance to the subsequent attack of moisture. In addition, cement is probably more apt to channel up around the casing when mixed with too much water, a condition conducive to failure of water shut-off.

When a well is wet and recementing contemplated, the first operation is to establish circulation if possible. Pump pressure is applied, usually for a short time, and the volume of fluid displaced is measured. Often swabbing or bailing is tried in order to increase the rate of leakage and then pressure applied to establish circulation. It is quite commonly believed that recementing is accomplished more easily and is more apt to be effective if the rate of leakage is high. This is not always true. On many jobs the rate of leakage was low and leaks were completely stopped by the displacement of small amounts of cement, in some instances less than a sack. In the Ventura field the best results are obtained by recementing immediately upon noting evidence of a leak, without letting the rate of leakage increase.

On many occasions insufficient time is spent by operators in trying to establish circulation in order to recement. When pressure has been applied for a few hours without any apparent effect, it is too frequently concluded that the well can not be recemented. There are some instances where the pressure was held on wells for four and five days before good circulation was established. The continued pressure on the resistance to circulation finally weakened and overcame it. Many second water strings might have been

unnecessary and their cost saved, with the added advantage of keeping the hole larger, if more time was taken to establish circulation.

Failures of cement jobs occur in spite of all usual precautions, and with strict attention given to quality of material used and to details of operation. Some of these will be known at the time of testing the job; others will occur at some later time, through some cause such as deterioration of the cement mass or failure at the contact of the cement mass and the formations. Recementing water strings, plugging off bottom water, plugging to confine edgewater to its native sand, and plugging to separate oil sands having considerably difference in pressure, are the most frequent and common oil field cementing operations.

The fact that most operators are open to suggestions and want all the best information available to help them solve their particular problem, prompts the following summary of practical procedure taken from a large number of successful operations performed under almost every condition common to oil field practice. Several petroleum engineers experienced in oil field cementing operations have materially assisted in the preparation of this paper by discussing, with the writer, details of the various methods of procedure and by offering valuable suggestions.

Recementing Water Strings.

Water strings frequently have to be recemented, sometimes immediately following the original cement job before any other casing is in the hole, and sometimes after the well has been on production, in which case an oil string or liner is present.

In all recement jobs any open hole below the shoe of the water string should be plugged up to within two or three feet of the shoe before recementing operations begin. When the cement is placed at the cementing depth, it should be forced out of the hole and behind the water string as quickly as possible. It is obvious that any open hole below the shoe would take cement under pressure if not properly bridged or plugged, and would delay getting cement where needed. The hole must be placed in such a condition that the cement can not be forced anywhere but out around the shoe.

No accelerator should be added to cement for recementing jobs. The difficulty and uncertainty of getting the cement where it belongs will only be increased by an accelerated tendency to set. The cement in such jobs usually has to go through small orifices and fill small cracks and spaces which add considerable resistance to its passage. A tendency to set rapidly increases the difficulty of getting the cement through these small openings.

Recementing, No Oil String or Liner Present.

There are three methods of recementing water strings when no oil string or liner is present, the choice between them depending upon conditions in the hole:

1. Recement through casing, just as the original cement job was performed, if free and open circulation can be established around the shoe of the casing, either to the surface or into the formations. This method is preferable if the circulation is sufficiently free. However, in the majority of recement jobs it is not applicable because fluid can not be forced away fast enough.

2. A second method is to dump cement on bottom, using a positive dump bailer, which will hold sufficient cement so that but one dump will be necessary, and then apply pressure at the surface by means of a packing head and high pressure pumps. Contamination of the cement by well fluids and agitation of deposited cement when dumping succeeding batches are the chief reasons for placing all the cement needed for the job at one dump. This method is applicable when the leak is small and the water under low head. It is not applicable when a considerable volume of water or high head water is coming around the shoe. The water will dilute and wash the cement, thereby destroying its setting qualities before it can be forced into position.

3. The third method of recementing is through tubing under pressure. This method is used especially in the deeper wells. With this method the operator has the choice of doing the job with or without a cement retainer. In either case a packing head should be placed on the casing so that the well may be packed off at the surface between the tubing and the casing. This will be a precautionary measure when the retainer is used, but a necessity when cementing without a retainer. Reverse circulation can not be established through tubing unless the well is packed off at the surface.

It is believed by some operators that recementing through tubing is a very hazardous operation and they are always very much concerned until the operation is completed. There is no occasion for cementing tubing in a well if ordinary precautions are taken. Gross carelessness is responsible for most instances of cemented tubing. When no retainer is used, the valve on the packing head outlet is usually left open to facilitate getting the cement to bottom through the tubing. This valve must be closed before any cement passes out of the tubing, or the cement will rise up behind it. A number of strings of tubing have been cemented in because this valve was closed too late, that is, after cement had passed out of the tubing and up into the casing. Closing the valve under such conditions only makes the situation worse by virtually insuring disaster. If this valve is found open when it should have been closed, the fact should be immediately brought to the attention of the person in charge of the operation, in order to prevent any serious consequences, if possible, by pulling the tubing up out of the cement. It is also possible under these conditions to circulate all the cement from the hole and start again with another batch of cement. Other causes of cementing tubing in the casing are the use of too much cement, the use of an accelerator in the cement, and the failure to withdraw sufficient tubing from the hole when large quantities of cement are placed in the bottom. All of these causes can be prevented, making cementing through tubing a reasonably safe operation.

As long as cement continues to go away, when cementing through tubing without a cement retainer, it must be assumed to be passing out of the hole and around the shoe. If, however, there is a leak or split in the water string, due to applied pressure, fluid may be forced out through the leak or split, and the cement allowed to rise in the casing back of the tubing. Tubing may be cemented in the casing under these conditions without the knowledge of the operator at the time, and through no carelessness on the part of any one. The fault, if any, is in the decision on the method of recementing, in not using a cement retainer.

On any job of recementing through tubing, the services of a crew experienced in this particular work, as well as the presence of a competent engineer to check computations, record data, and observe operations, are good safeguards against mistakes.

Procedure Using Cement Retainer.

When a cement retainer is used the bottom of the tubing should be about 10 feet above the cementing point. The cement can be quickly pumped to the bottom of the hole through the tubing, and pump pressure applied to force it back behind the casing into position. The retainer prevents the cement from coming up between tubing and casing, and a valve in the retainer prevents any cement which has passed through the retainer from coming back into the tubing. When all the cement has been pumped away that can be displaced with the maximum pressure to be applied, or when the total volume of cement to be used in recementing has been displaced, except from the bottom 50 feet of tubing, the pressure on the tubing is released at the surface and the tubing unscrewed from the retainer. The remaining cement in the tubing is then circulated out of the hole, usually by reversing the direction of the circulation, pumping fluid into the hole between the tubing and the casing and returning the excess cement back through the tubing to the surface. Reversing the circulation prevents any cement getting back of the tubing after it is freed from the retainer, and is the quickest way of removing it from the well. The tubing is then removed, some pressure put on the casing through the packing head, and the well closed in while the cement sets.

Advantages of Using Cement

One advantage of using a cement retainer is that the cement does not remain in the bottom of the hole for a time before the pressure is applied, but is forced out into position as it reaches the bottom. Another advantage is that its use offers positive assurance that as long as the cement is passing out of the tubing it is going into its intended position. When a cement retainer is used, greater pressure can be applied with safety, to force the cement out around the shoe of the casing, because the retainer prevents the water string from being subjected to the pressure exerted. It also prevents the

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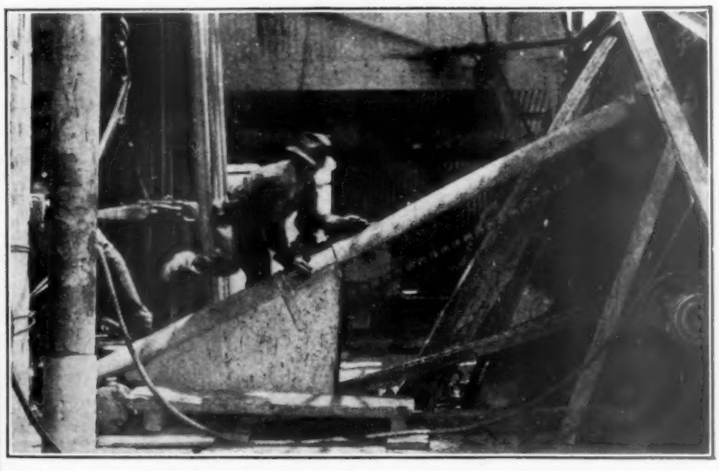

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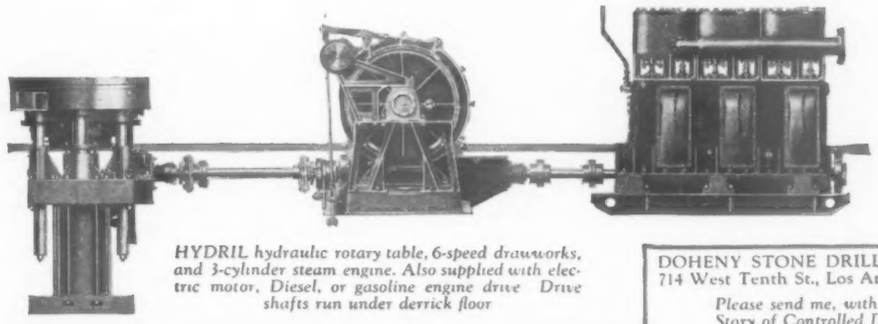

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return of any cement into the casing when pressure on the tubing is released.

Objections to the Use of Cement Retainers.

The principal objection to the use of the cement retainer is the difficulty sometimes experienced in unscrewing the tubing from it. The number of turns of the tubing required to free it depends upon the number and size of threads in the joint. Two and one-half inches of make-up, using 11½ threads to the inch, would require about 30 turns of the tubing to unscrew it. In addition to this, there is usually some make-up in the tubing joints and also a number of turns of the tubing will be taken up in tortion. The longer the string of tubing, the more turns are required to free it. Unscrewing the tubing from the cement retainer is not easy and is one part of the work about which operators are most apprehensive when using the retainer.

It sometimes happens that the maximum pump pressure under which the well is to be recemented is reached when there is yet considerable cement in the tubing. If trouble is experienced in unscrewing from the retainer at such a time, the cement would set in the tubing before it could be flushed out. The only consequence in this event would be some plugged tubing, part of which might have to be discarded. There would be no danger of the tubing becoming cemented in the casing, however, which is the one important thing to guard against in any recement job by the tubing method.

Another reason some operators hesitate to use a cement retainer is the fear that the tubing or retainer may leak, allowing enough cement to escape to cement the tubing in the casing. However, any cement entering the space back of the tubing through a leak in the retainer or through a split in the tubing would be indicated at the surface by an escape of fluid from between the tubing and the casing. For this reason, to provide an indicator for leaks, the space between the tubing and casing should be filled to capacity before cementing operations begin.

In case a leak occurs in either tubing or retainer, the pressure on the tubing should be immediately released, and pressure built up in the casing by pumping in fluid between the tubing and casing through the packing head. Reverse circulation may or may not start, but the pressure will prevent the entry of any additional cement behind the tubing. At the same time the tubing should be unscrewed from the cement retainer and withdrawn from the well when the cement has been circulated out. A test should be made to determine whether sufficient cement was forced around the shoe of the water string, before the leak occurred, to effect a complete water shut-off. If the job is not successful it would necessarily have to be repeated after properly preparing the hole.

A pulling strain held on the tubing when unscrewing it from the retainer aids in the operation. The strain will keep the tubing away from the casing and increase the possibility of washing over and removing it, should the tubing become cemented in. The retainer holds the tubing centered in the hole at the bottom, and the strain will tend to keep it well centered up through the distance which would be in contact with cement.

Cement retainers may be used on any recementing job through tubing if the fluid can be forced out of the hole at a rate fast enough to allow the cement to get to the bottom and be forced into position before initial setting begins.

A retainer must be used when recementing a water string which will not withstand very high pressure because of a worn or weakened condition.

It is advantageous to cement without a retainer if the leak is small and only a small amount of cement can be forced away. In such cases a small quantity of cement can be pumped to the bottom of the hole quickly and without pressure because circulation behind the tubing can be established to the surface.

A retainer can not be used when the casing is out of round or dented, because the retainer can not be made to fit tightly enough to prevent leakage. A test for leakage should be made by applying water pressure on the tubing before putting in any cement.

Procedure Without Cement Retainer.

When a cement retainer is not to be used, the tubing should be lowered to the bottom of the hole, the well washed with water, and the cement started down through it. When it is calculated that the cement has reached the bottom of the hole, the tubing should be slowly raised as the cement passes out of it. When sufficient tubing has been withdrawn to bring the bottom of it safely above the top of the deposited cement which can be calculated readily, the well should be closed in at the packing head and pressure applied through the tubing at the surface, forcing the cement out around the shoe. The volume of cement in cubic feet placed in the hole is known from the number of sacks used. The quantity of water in cubic feet pumped in to displace the cement must be accurately measured but must not exceed that of the cement in the bottom of the hole. The operation should be continued as long as fluid can be pumped in, up to the time when only a small amount of cement remains in the bottom of the casing, when the operation should cease and the well be shut in. If pumping is continued too long, all of the cement may be forced away behind the casing and perhaps none will remain at the shoe to effect a water shut-off: This procedure can be carried out successfully where it is known that only a small amount of cement can be displaced from the casing.

In cases where it is known that a considerable quantity of cement will have to be used and that cement may continue to go away for a considerable period of time before pressure is built up, the procedure in using tubing only is somewhat different from that just described. In this case the hole is thoroughly washed with water and the cement introduced into the tubing at the surface. When it has just reached the bottom of the tubing the outlet valve on the packing head is closed, the tubing drawn back a few feet off bottom, and pumping continued until the hole will take no more cement under the maximum pressure that can be applied with safety to the casing. As soon as no more cement can be forced out of the tubing at that pressure, the outlet valve on the packing head at the surface should be opened just enough to establish circulation. The pressure on the cement forced out around the shoe should be maintained, and in order to do this the pumps should be speeded up as the outlet valve is opened. The excess cement in the tubing is flushed from the hole either by direct or reverse circulation, the tubing being raised as the operation proceeds as far as the surface connection will permit. When the tubing has been cleared of all cement and it is certain that no cement remains in the hole above the bottom of the tubing, the well may be closed in until the cement sets sufficiently to maintain its position. If it is deemed necessary to take out additional tubing before closing the well in, it will be necessary to release the pressure on the casing.

In recementing through tubing without a retainer, it is general practice to put pressure on the cement to force it away, then release it for a short interval, as the tubing is pulled back several stands, to safeguard against cementing it in the casing, and to again apply pressure. It is not considered good practice, however, to release the pressure, which has been placed on cement to force it back of the water string, until it has had sufficient time to set and harden. A portion of the cement forced out of the hole into position behind the water string may come back into the hole when the pressure is released, and if so it may not again be displaced when the pressure is applied the second time. If this happens there may be a limited space behind the water string without much cement in it, and a leaky job may result.

Objections to Recementing Without a Cement Retainer.

The principal objection to recementing through tubing without a retainer is that the casing must be subjected to the pressure necessary to force the cement around the shoe into position. In using this method the operator is limited therefore to a recementing pressure which the water string is capable of withstanding, and this pressure can only be assumed. Sometimes casings are more damaged and weakened than is realized and the assumed safe pressure is more than the casing can withstand. If the casing should leak under the assumed safe pressure, cement will rise back of the tubing as pumping continues, without the knowledge of the operator, as it is impossible to determine whether the cement is passing around the shoe or up between tubing and casing toward the point of leakage. It is a good precautionary measure, when recementing is performed under these conditions, to place wooden rings, slightly smaller than the diameter of the water string, on the lower portion of the tubing. These rings will keep the tubing centered in the hole so that if it should become cemented in the

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casing it can be washed over and recovered. Unless this is done the operator is apt to drill out of the water string in trying to remove the cemented tubing.

Another important objection is that the displacing pressure on the cement must be released before the cement will have set hard enough to remain in position while the tubing is pulled back to safety. A return of cement into the casing may occur during this temporary period and cause a failure of shut-off.

Recementing With Oil String or Liner Present.

When it is necessary to recement a water string with the oil string or liner in the hole, the cement must be forced through the perforations in the oil string and out around the shoe of the water string to stop the leak. To be able to accomplish this the cement must be prevented from going either down or up on the outside of the oil string as well as on the inside of it. This requires a suitable barrier both in and behind the oil string, below the point of recementing, and the application of pressure between the oil string and water string at the surface. The bridging material used as a barrier must be such that it will not clog or seal the oil sands, and which can be removed readily when the job is completed. The best material to use in forming such a bridge anywhere in the oil producing formations is sand, screened through a sieve finer than the perforations in the oil string.

In recementing a water string through the oil string, the hole should first be cleaned out to bottom and the perforations in the oil string thoroughly washed with water, removing the oil and any mud fluid from the well. Water must be used, as sand would not settle readily through mud fluid or oil.

When the hole has been thoroughly washed the tubing should be lowered until it is just off bottom. A funnel should be placed in the top of the tubing and a stream of water turned into the tubing from the hose. The sand should be poured into the funnel and carried down the tubing with the water, settling in the bottom of the well. Since the top of the tubing will be higher than the overflow pipe between tubing and casing, the tubing will not be filled to the top as long as the water and sand pass out of it at the bottom, and water overflows from the casing at the surface. When the sand has filled up to the bottom of the tubing, the tubing will begin to plug up and the overflowing behind it at the surface will stop. If this is not noted, continued running in of sand and water will cause the tubing to fill to the top. When the overflow stops or the tubing fills to the top, the tubing should be pulled up any desired distance, after which the sand will continue to run out of the bottom of the tubing. the screened sand passes through the perforations in the oil string, making a bridge both inside and outside of the oil string. This operation continues until the top of the sand bridge is built up to the desired depth. The location of the top of the sand bridge is very easily controlled, and can be determined by setting the tubing on it.

It is evident that the placing of sand bridges in holes can only be done when the pressure in the sands is less than the hydrostatic pressure of the head of the water to the surface. If the hole can not be filled with water, sand can be placed in the hole in the same manner and the sand bridge built up. However, the only evidence that the sand has filled up into the tubing will be the filling of the tubing to the top with water.

When the sand bridge has been placed in the well, recementing can be carried out either by the dump bailer or by the tubing method, with or without a retainer, depending upon existing conditions. However, arrangements must be made to pack off between the water string and the oil string as well as between the oil string and the tubing. There must also be suitable perforations in the oil string for the purpose of recementing through them. If there is doubt about the perforations being large enough, the oil string should be reperforated before the recementing operation is commenced.

After the recementing operation is completed and the job tested, the sand bridge is cleaned out of the hole by circulating water through the tubing.

Cementing Combination Oil-Water Strings.

Combination strings are originally cemented when the hole is still full of mud fluid from the drilling work. Heavy mud settles in the bottom of the hole while the string of casing to be cemented is being run. When the casing is in place, tubing is run in to the cementing depth, and good circulation established through the perforations to the surface back of the combination string. A cement retainer may or may not be used on the tubing, as preferred. With good circulation established, cement is pumped through the tubing, through the perforations and up behind the solid casing. Steps must be taken to prevent the cement from coming up between the tubing and casing. When it is calculated that cement is high enough behind the combination string, the opening between that and the next larger string is closed and the cementing operation completed with pressure as high as safety will permit. The heavy mud fluid in the bottom of the hole protects the oil sands below the cementing point from the cement.

When the cementing operation is completed the tubing must be loosened from the retainer, if used, and the cement remaining in it circulated out by direct or reverse circulation. The tubing must then be removed from the hole as soon as possible and pressure put on the well while the cement sets.

Recementing Combination Oil-Water Strings.

In recementing a combination string the procedure is very similar to recementing a water string through a perforated oil string. The hole should be cleaned out to bottom and washed with water. It should then be bridged with "screened sand" up to the point where it is to be recemented.

Rarely can circulation to the surface be established when recementing combination strings. The operation is not actually recementing, but amounts to plugging through perforations just below the depth of combination shut-off. With good furtine some cement may be forced up around and behind the previous combination plug, but there is no way of determining that this has happened. The sand bridge is therefore built up to within a few feet of the previous combination job, usually from 10 to 20 feet, depending principally upon the formations. Recementing is then done by either the dump bailer method or through tubing without a retainer, as previously described. When the cement has set, and the job has been tested, the sand bridge is washed out by circulating water through tubing.

Cementing Solid Liners.

A number of solid liners were cemented in wells in the Los Cerritos area of Long Beach field, the operation being commonly termed a "squeeze job." In using a liner for a water string it is necessary not only to effect a water shut-off at the bottom, but to prevent water from coming up over the top of the liner. In performing the operation the liner was introduced into the hole on the drill pipe, being attached by left-hand thread, a sufficient length being used to reach from the cementing point to about 200 feet inside the larger water string. Cement was pumped down through the drill pipe, through and around the liner, sufficient cement being used to extend between 30 and 40 feet above the top of the liner. The liner was then set on bottom and the drill pipe unscrewed from it and pulled back a short distance. After circulating mud fluid or water for a time, to make certain no cement remained in the drill pipe or behind it, the well was shut in and pressure applied to the cement. The liner was thus buried in cement. Before it had set very hard the cement remaining inside the liner was drilled or washed out to within about 10 feet of bottom. Before drilling out the remaining cement a bailing test was conducted to demonstrate that water was prevented from overflowing the top of the liner from behind it. If the test showed water entering the hole over the top of the liner, additional cement was dumped to fill the hole above the top of the liner and pressure again applied to force cement between the liner and the water string and the test repeated until satisfactory results were obtained. When this test was satisfactory, the remaining cement in the liner was drilled out and a bailing test on the water shut-off at the shoe made. Recementing at the shoe of the liner could be done in a manner similar to recementing any water string.

Placing Cement Plugs.

When cement plugs are placed in a well for excluding or controlling water or for purposes of conducting tests, their location and thickness must be given as careful consideration as the cementing depth of the water string. The necessity of ap-

plying the fundamental principle of stratigraphic uniformity of water control in the oil horizon by means of properly placed plugs has been discussed.

Plugging Off Bottom Water—No Oil String in the Hole.

In many wells drilling is continued through the known productive oil horizon into formations below in an attempt to discover new oil sands or to establish the limiting depth for wells. When gray sands are encountered which look as though they might contain water, and it is decided not to continue prospecting, the bottom of the hole should be plugged with cement to keep the water, if any, from infiltration into the overying oil sands. The drill pipe should be lowered nearly to bottom and thinned mud fluid circulated until all the fluid in the hole is of uniform consistency. The number of sacks of cement necessary for the job is calculated from the size of the bored hole and the depth of the hole to be plugged. The cement is pumped into the hole through the drill pipe and deposited in the bottom of the hole. The volume of mud fluid following the cement is measured. When it is known from calculations that the cement is passing out of the drill pipe at the bottom, the drill pipe is raised just fast enough to keep the bit up near the top of the cement. Usually the drill pipe is moved up and down through the cement to prevent channeling and to insure compactness of the plug. A few operators rotate the drill pipe very slowly. When all the cement has been deposited in the bottom of the hole the drill pipe is pulled up some distance above it and pressure applied if necessary.

Sometimes more cement is pumped into the drill pipe than is actually needed to build the plug up to the desired point, the excess cement being to provide for any loss into the formations. When excess cement is used the drill pipe is pulled back to the intended top of the cement plug and any additional cement circulated out of the hole, after which pressure may be applied if desired. Cement slurry used for this purpose should be as heavy as it is possible to pump. The specific gravity of the cement slurry must be greater than that of the mud fluid in the hole in order to properly displace it. To be effective, the cement plug must be in contact with the formation walls, which necessitates complete removal of the mud fluid.

Rotating Drill Pipe When Cementing.

Slow rotation of the drill pipe may prevent it from sticking, should the cement come up around it, and there may be less chance of the cement channeling than when it is placed on the bottom without rotation. On the other hand, if the drill pipe is rotated the cement may become contaminated with the mud fluid in the hole, resulting in a poor plug, and there is also danger of losing bottom joints of drill pipe when rotating off bottom. Rotation may be unnecessary as moving the drill pipe up and down through the slurry should prevent channeling and force the cement in contact with all portions of the formation wall.

Plugging Off Bottom Water—With Oil String in the Hole.

The exclusion of bottom water from the overlying oil sands is more difficult after the oil string is in place than in open hole. In order to exclude the bottom water from the first overlying oil sand, the impervious plug must be placed on the outside of the casing, against the formation walls, as well as on the inside of the casing. Plugging inside the casing without specialoeffort to force cement to the outside is generally ineffective. In order to insure contact of the cement with the formation walls the casing should be destroyed through ripping or by use of light shots through the interval at at which the cement plug must be placed. If shots are used, good judgment must be exercised because of the danger of splitting or collapsing the casing above the place to be plugged and erate oil pipe lines or contract the conmaking it impossible to get down in the casing to clean out and put in the cement. The hole below the cementing depth may be plugged or bridged with any kind of material desired. Any cement used in this bottom portion of the hole will not be of value in preventing the upward migration of the water. The shot cavity or formation walls opposite the ripped portion of the casing is then thoroughly cleaned out by circulating wash fluid, preferably water. The cement to form the plug is then introduced into the hole, either by the dump bailer method or through tubing. Pressure can not be applied to this cement if there are perforations in the oil string above it. When the cement has set the test of water shut-off can be made. If the water is not excluded the cement should be cleaned out through the destroyed casing and the operation of destroying casing and plugging repeated. Replugging is performed in the same manner as the original plugging was done.

Plugging to Control Intermediate Edge Water.

Wells in which edgewater appears have been on production and therefore have oil strings or liners in them. The exact location of the edgewater is determined by a suitable method. If it should be in the bottom sand in a well, it is treated as a bottom water and plugging operations are conducted in the manner just described. Many times, however, edgewater occurs in the middle of a zone, with good production both above and below. An edgewater of low head can be confined to the sand stratum in which it occurs in a manner to permit production from above and below, simultaneously. (See well No. 1, Figure 1.) The hole is first cleaned out to bottom and the perforations in the oil string thoroughly washed to the top of the shale bed (A) overlying the edgewater. The hole is then filled with "screened sand" up to the bottom of the shale bed (C), underlying the edgewater. Cement is then dumped into the hole to fill up from the bottom of shale (C) to the top of shale (A). If the perforations in the oil string between these points are not sufficiently large to insure the cement gaining access to and bonding with the walls of the shale strata, this portion of the oil string should be reperforated before putting in the cement. The cement may be placed in the hole with a dump bailer or through tubing, as preferred. Dependence for the control of the edgewater is placed solely in that portion of the cement plug which comes in contact with and binds securely with the shale strata above and below the water.

If it is decided to produce from only the sands above the edgewater sand, the cement and sand placed inside the perforated casing is not disturbed, leaving the lower portion of the hole below the edgewater plugged off. If on the other hand production is desired from both above and below the edgewater sand, the cement within the casing may be cleaned out before it has hardened too much. When the cement back of the oil string has sufficiently set, the screened sand below the shale stratum (C) is circulated out, using water or oil, and the well put back on production.

When it is decided to produce only from oil sands below the edgewater sand, it is necessary to remove all of the oil string possible, redrill, and cement a second water string in the first shale stratum below edgewater sand, as represented by shale (C) (See well No. 3, Figure 1). The portion of the oil string to be sidetracked should be plugged solidly with cement up to the bottom of the shale (C). The casing should be reperforated from the top of this cement plug to the top of the shale stratum (A) overlying the edgewater sand, and after being thoroughly washed, filled with cement. Either the dump bailer or the tubing method may be used to place the cement in the casing. It is well to conduct a bailing test at this stage, to determine the effectiveness of the plug in preventing the edgewater from infiltrating into the overlying oil sands. If indications are that water is excluded by the plug, it is reasonable to assume that the water is also prevented from going downward into the underlying oil sands. If, however, the plug fails to prevent the water coming upward, it should be assumed that it is not prevented from going downward, as the conditions are exactly similar above and below the edgewater, and the entire job should be repeated. The hole is then redrilled from any point below the top water shut-off and a new water string cemented in the shale (C) by the regular method of cementing water strings, the formations back of the water string being protected by the usual mudding and cementing operations.

It is advantageous, from a conservation standpoint, to separate oil sands, which have high gas pressure and are capable of producing larger quantities of oil, from partially depleted or low pressure sands, which together form a continuous oil zone.

Where the two portions of the zone are to be separated after the well has been producing, the cementing operation is performed by the same methods as used in controlling edgewater.

COMPLETIONS FOR PAST WEEK IN U.S. FIELDS

SUMMARIZED REVIEW OF FIELD RESULTS

State—	Completions This week	Completions Last week	Producers This week	Producers Last week	Gas Wells This week	Gas Wells Last week	Failures This week	Failures Last week	Initial Prod. This week	Initial Prod. Last week
Arkansas	2	1	2	1	..	..	..	..	102	10
California	13	20	12	17	..	..	1	3	12,400	29,301
Illinois	5	6	4	3	..	..	1	3	83	69
Indiana	2	1	2	1	..	..	..	..	14	10
Kansas	21	15	6	5	3	3	12	7	1,655	1,375
Kentucky	8	17	5	13	2	..	1	4	75	136
Louisiana	11	10	3	3	4	2	4	5	870	340
Michigan	4	9	4	6	..	..	..	3	1,285	1,450
New Mexico	2	5	1	5	..	..	1	..	225	13,650
New York	..	13	..	13	..	..	..	..	...	51
Ohio	40	43	13	20	18	12	9	11	707	564
Oklahoma	47	35	36	27	5	2	6	6	130,306	167,827
Pennsylvania	5	81	4	74	..	2	1	5	17	270
Tennessee	36	..	11	..	18	..	7	..	112	...
Texas	119	126	69	73	7	10	43	43	45,630	35,343
West Virginia	..	28	..	6	..	19	..	3	...	30
Total	315	410	172	267	57	50	76	93	193,481	250,426
Increase this week	..	..	..	..	7	..	..	..	...	...
Decrease this week	95	..	95	..	..	..	7	..	56,945	...

OKLAHOMA

Company, Well and Location	Initial Production Bbls.	Depth
CADDO COUNTY—		
Louisiana Oil & Refg., Rowe 1, swc nw ne, 36-6n-10w	600	3273
Magnolia, Rowe 3, se ne ne, 36-6n-10w	*	3460
CARTER COUNTY—		
Magnolia, Hightower 3, sw nw ne, 30-1s-3w	*	4370
CREEK COUNTY—		
Magnolia, Lewis 12, cwl sw, 27-17-7e.	10	2413
LINCOLN COUNTY—		
Magnolia, Freeman 1, sw se se, 8-14-4e	52	5003
McCLAIN COUNTY—		
Homaokla Oil Co., Newsome 1, se ne ne, 16-5-3e	45	2953
MARSHALL COUNTY—		
Bilbo Oil Trust Co., Taliaferro 4, nec se se se 14-5s-5e	40	558
C. B. Goddard Oil Co., McComas 4, sw c 13-5s-5e	25	532
MUSKOGEE COUNTY—		
John Aggas, Hawkins 4, swc se 28-16-15e	*	1488
Arthur Oil Co., Spaulding 10, nec se nw ne, 34-15-18e	¶½	840
L. R. Kershaw, Fee 1, sw c se se 15-13-18e	¶2/25	695
OKFUSKEE COUNTY—		
Mitchell Oil Co., Randall 5, nec nw 30-12-12e	70	1650
OKLAHOMA COUNTY—		
Indian Territory Illum., Wheeler 2, se nw se 13-11-3w	2245	6500
Indian Territory Illuminating et al, Verne 1, nw sw se 13-11-3w	2905	6514
Indian Territory Illuminating et al, Drake 2, sec 14-11-3w	8780	6391
Indian Territory Illuminating et al, Fortson-Farley 1, nw ne ne, 24-11-3w	8995	6497
Indian Territory Illuminating et al, Oklahoma City 1, c se se, 24-11-3w	6745	6624
Coline Oil Co., Clauer 3, sec 25-11-3w	4600	6499
Indian Territory Illuminating et al, Emmerson-Joyce 1, nec 25-11-3w.	675	6664
Indian Territory Illuminating et al, Mackey 1, nec 26-11-3w	199	6443
Coline Oil Co., Warren 1, swc 18-11-2w	27,167	6516
Indian Territory Illuminating et al, Canfield-Button 1, se ne sw 19-11-2w	15,675	6511
Indian Territory Illuminating et al, Farley 1, nwc 19-11-2w	30,438	6507
Shell Pet. Corp., Petty 5, nw sw ne, 30-11-2w	35	6504
Shell Pet. Petty 6, ne nw ne, 30-11-2w	3876	6504
Shell Pet. Petty 7, se nw ne, 30-11-2w	1197	6420
OKMULGEE COUNTY—		
Lambert Oil & Gas, Blake 2, swc nw se, 7-13-15e	¶¼	1247
PAYNE COUNTY—		
Glen Smith et al, Curley Chier 2, se sw se, 33-19-5e	12	2175
Shaffer Oil & Ref. et al, Searcy 1, se c sw, 4-18-5e	¶3	2720
PONTOTOC COUNTY—		
Magnolia, Reed 8, swc se nw sw, 17-5-8e	125	2638
Independent Oil & Gas, Jones 1, swc, 8-5-5e	*	2853
POTTAWATOMIE COUNTY—		
Magnolia, Lynn 2, se ne ne, 21-7-4e.	170	3800
SEMINOLE COUNTY—		
Carter, Harber 3, sw se se, 7-9-6e.	215	4320
Sinclair O. & G., Nichols 7, sw ne nw, 19-9-6e	1110	4226
Tidal Oil Co., and Interocean, Lasley 1, ne ne sw, 19-9-6e	3665	4110
Amerada Pet. Corp and Dixie, Fullerton 2, ne e se 19-9-6e	3275	4189
Tidal et al, Harjo 1, nw ne nw, 20-9-6e	425	4290
McMan Oil Co., Jones 1, nw se nw, 20-9-6e	1270	4249
Magnolia, Moore 3, se ne se, 24-9-5e.	1270	4173
Carter, Coker 3, nw se sw, 2-8-5e...	1265	4231
Mid-Continent Pet. Corp., Yarhalo 2, nw sw ne, 8-7-7e	1930	3295
Carter, Walker 4, ne c nw, 24-7-6e..	550	4145
Carter Oil Co., Brannon 1, nw sw nw, 18-6-8e	¶10	2798
Independent, Simedihake 1, se c ne, 8-6-6e	645	2899
Continental Oil, Harjo 1, nw c se, 26-8-5e	*	4431
W. B. Pine, Harjo 1, ne c nw, 31-7-6e	*	1305
TULSA COUNTY—		
Union Drilling Co., Anthis 2, nec 13-19-10e	6	1857

KANSAS

Company, Well and Location	Initial Production Bbls.	Depth
BUTLER COUNTY—		
Sanford et al, Coveat 1, c ne ne sw, 10-28-5e	*	3005
CHATAUQUA COUNTY—		
Griffin and Bell, Oliver 7, nw sw se, 1-32-10e	¶4	1984
COWLEY COUNTY—		
Mission Oil Co., Martin 1, c nw nw 21-31-6e	¶10	1618
Roth and Faurot, Reidy 1, ne c se 31-31-8e	85	1985
Wilson et al, Peacock 1, c nw nw se 36-32-4e	*	1441
J. A. Hull Oil Co. et al, Bartlow 7, se nw nw 19-32-5e	*	3027
GREENWOOD COUNTY—		
Walton Oil Co., Dalton 2, nw sw nw 5-24-13e	*	1644
Dixie Oil and Amerada Pet. Corp., Ellis 4, se nw nw 27-23-11e	75	1929
Empire Oil & Ref., Patterson "C" 5, se c sw se se 36-23-11e	395	1780
Young et al, Bowman 1, cel se nw 7-24-13e	15	1638
McPHERSON COUNTY—		
Derby Oil Co., Krehveil 1, nw ne sw 34-20-3w	*	3622
Mid-Kansas Oil & Gas Co., Larson 2, nw ne sw 31-18-2w	*	3480
Sinclair Oil Co., Voshell 2, sw c nw, 10-21-3w	945	3348
PRATT COUNTY—		
O'Haver and Jones, Lunt 1, c sw nw 15-28-14w	*	4745
RICE COUNTY—		
Boucher Oil Co., Boy 1, sw c, 16-21-10w	¶10	2553
SALINE COUNTY—		
Templeman Brothers, Laubengayer 1, c sw, 20-15-5w	*	3812
Ira L. Keith, Holmquist 1, se sw se 10-15-4w	*	3690
Twin Mound Oil Co., Weis 1, nw c sw ne nw 20-12-4w	*	630
SEDGWICK COUNTY—		
J. S. Cosden, Dewers 1, ne nw sw 1-26-1w	*	4015
Continental Oil Co., Semroth 1, nw nw nw 25-28-4w	*	4309
SUMNER COUNTY—		
Slick, Pryor & Lockhart, Peasel 1, nw c 33-31-1w	140	3659

CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
ELWOOD—		
Barnsdall Oil Co., Luton-Bell 14	3400	3637
LONG BEACH—		
Richfield Oil Co., Green 5	250	7703
POTRERO—		
Thom. F. Barton, No. 1	350	4160
SANTA FE SPRINGS—		
General Pet. Corp., S. F. 206	1200	7960
No. 220	1100	8000
S. F. Comm. 186-H	1250	8001
Richfield Oil Co., Industrial 1	1600	8040
Shell Oil Co., G. H. N. 29	700	7840
Standard Oil Co., S. W. C. 25	1300	7927
S. W. C. 27	550	7940
SEAL BEACH—		
Associated Oil Co., Bryant 4	100	4975
VENTURA—		
Associated Oil Co., Lloyd 34	600	7178

EASTERN STATES

PENNSYLVANIA

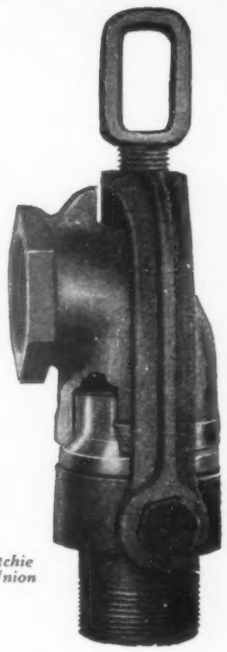
Company, Well and Location	Initial Production Bbls.	Depth
WASHINGTON COUNTY—		
Natural Gas Co. of W. Va., R. Stotler 1	10	....
McKeon 2	2	....
ALLEGHENY COUNTY—		
Jacob Morris & Co., Patton 3	3	....
H. H. Huff, Setzepfahted 1	2	....
GREENE COUNTY—		
Peoples Nat. Gas Co., Taylor 1	*	....

SOUTHEASTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
MONROE COUNTY—		
Shay McMullen, Hines 2	¶¼	1896
Cora Staudt & Co., Heisz 6	¶¼	907
C. C. Stover Oil Co., McMahan & Co. 3	*	1770
Michael Wahl & Co., Wahl 17	*	645
MORGAN COUNTY—		
Williams Bros., Smith 6	¶1¼	890
Pure Oil Co., Eppley 2	15	1337
Ohio Fuel Gas Co., Coler 1	¶¾	1592
WASHINGTON COUNTY—		
Yonley Oil & Gas Co., Holland 12.	¶½-2	1889
Blossom Oil Co., Schneider 3	1	2005
James Rinard & Co., Enoch 3	*	831
NOBLE COUNTY—		
E. S. Warne, King-Morris 1	*	2185

MacClatchie Quick Change Head

MacClatchie Stop Cock



MacClatchie Quick Union

three of a kind . . . the *practical* kind!

MacCLATCHIE Quick Change Head, for cementing, circulating and capping oil wells, assures a tight joint in 30 seconds without risk. It affords a means of opening the well casing without removing the connections from the head. Safety is assured always, because the more pressure within the casing, the tighter the slips and rubber become.

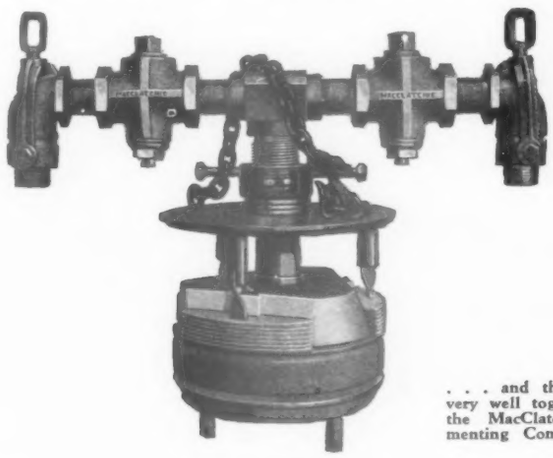
THE MacClatchie Stop Cock has a record of unfailing service under all conditions and is now equipped with Alemite lubrication fittings for even greater efficiency. Extra long bronze cores, heavy brass nuts and brass "no-foul" washers eliminate breakage. These stop cocks have long been used by cementing companies in all leading fields.

INSURING a safe, fast and sure connection, the MacClatchie Quick Union is one of the most useful field specialties ever devised. This multi-purpose union does away with the loss of time and temper always involved when threads get crossed. Connected and disconnected in a flash, it will be found useful wherever oil wells are cemented.

MacCLATCHIE MUD PUMP VALVE

There are more MacClatchie Valves used than any other make in the world . . . . *Quality* is responsible!

Stocked By All Mid-Continent Continental Supply Stores



. . . and they work very well together, as the MacClatchie Cementing Combination.

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Mud Pump Valves — Quick Unions — Stop Cocks — Quick Change Heads
Flow Nipples — Valve Seat and Pump Liner Pullers — Pump Pistons
MacClatchie "Panther" Aircraft Engines

CENTRAL OHIO

Company, Well and Location	Initial Production Bbls.	Depth
MUSKINGUM COUNTY—		
Craig, Adair & Co., Cannon 1	135	3503
Wittmer Properties, Tr., Nelson 1	8	4118
Ohio Fuel Gas Co., Moore 1	¶¼	3694
Dr. G. C. Taylor, Smitley 2	¶¼	4365
PERRY COUNTY—		
Vance Webb & Co., Miller & Co. 1	145	3536
Crawley & Co., National Pottery Co. 1	¶½	3533
McClay & Whitmer, Brown 5	100	3495
John Elder & Co., Metzger 7	*	750
MEIGS COUNTY—		
Linkhouse & Co., Stansbury 1	¶¼	743
T. Chase & Co., Mutchler 2	¶¼	738
Cochran & Co., Stansbury 2	*	1796
Frick & Barnaby, Genheimer 9	4	....
SUMMITT COUNTY—		
East Ohio Gas Co., Steese 1	¶6	4154
F. A. Brendall & Co., Kinz 1	¶2½	4126
Steigner 2	¶2	4047
Rickenville O. & G. Co., McCaughy 1	*	4026
GUERNSEY COUNTY—		
East Ohio Gas Co., Gray 7	50	3532
Berlin 1	60	....
LORAIN COUNTY—		
Daugherty Co., McGuire 1	¶4½	2300
Ohio Fuel Gas Co., Bruce 1	¶½	....
LICKING COUNTY—		
Hope Construction & Refg. Co., Bannon 5	100	2902
HOCKING COUNTY—		
Preston Oil Co., Liff 3	85	....
ATHENS COUNTY—		
Townsend O. & G. Co., Penrod 2	2	1194
PIKE COUNTY—		
Beasley & Co., Armontrout 1	¶¼	....
ASHTABULA COUNTY—		
Schaeffer Bros., White 1	¶¼	2729
TUSCARAWAS COUNTY—		
Ohio Fuel Gas Co., Davis 1	¶¼	3478
LAWRENCE COUNTY—		
Ohio Fuel Gas Co., Rucker 1	¶¼	3131
HARRISON COUNTY—		
A. C. Phillips & Co., Keller 1	*	625
KNOX COUNTY—		
Pure Oil Co., Crider 1	*	3083

INDIANA

DAVIESS COUNTY—		
L. G. Lee & Co., Peek 3	10	1345
PIKE COUNTY—		
C. L. Diver, Walton 1	4	1399

ILLINOIS

ST. CLAIR COUNTY—		
Ohio Oil Co., Gaskill 3	60	663
Hans Wolf, Anderline 2	8	....
MONROE COUNTY—		
Abbott & Connelly, Hardy-Derment 1	10	....
WABASH COUNTY—		
J. S. Young & Co., Sparks 3	5	1385
CRAWFORD COUNTY—		
Arkansas Fuel Oil Co., Vaughn 1	*	865

MICHIGAN

MIDLAND COUNTY—		
Pure Oil Co., Reems Indiana Land C-4	800	3550
ISABELLA COUNTY—		
Dixie Oil Co., Eastman 1	250	3502
Pure Oil Co., Gibson 6	200	3535
SAGINAW COUNTY—		
Saginaw Prospecting Co., Spatz 75	35	1700

KENTUCKY

DAVIESS COUNTY—		
Evans & Garrison, Malone 1	30	....
¼¼¼¼¼ shrdl cm shrdlu cmf cmf shr shrshr		
MUHLENBERG COUNTY—		
Benedum-Trees Co., Drake Estate 1	¶7	....
Ellis, Young & Co., Rice 3	*	1752
OHIO COUNTY—		
S. R. Berry & Co., Smith 1	15	....
Jas. C. Ellis & Co., Royal Hrs. 4	15	....
George Randolph & Co., Kirk 1	5	....
Swarthout, Rhodes & Co., Hartford 1	¶½	....
Louisville Gas & Electric Co., Royal 1	10	....

WEST VIRGINIA

Company, Well and Location	Initial Production Bbls.	Depth
RITCHIE COUNTY—		
R. R. Roberts & Co., Perrine 1	10	....
I. W. McGinnis & Co., U. S. Oil 8	¶¼	....
E. E. Pope, Wilson 7	10	....
Joseph E. Leach, Darling 1	*	....
Warrior Pet. Co., McGinnis 1	*	....
Carnegie Nat. Gas Co., Vincent 1	*	....
BOONE COUNTY—		
Pure Oil Co., Federal Coal 38	10	....
Federal Coal 43	¶¼	....
Lafayette B-tract 32	¶1½	....
United Fuel Gas Co., Numa Black Coal 3965	¶1¼	....
G. L. Cabot, Federal Coal 1	¶1¼	....
CLAY COUNTY—		
Virginian Gasoline & Oil Co., Brown-Swan 20	12	....
South Penn Oil Co., Phillips 7	20	....
D. H. Stephenson, Harshbarger 5	2	....
LINCOLN COUNTY—		
United Fuel Gas Co., Dotson 3908	¶½	....
A. F. Morris, Trustee, Houldren 1	¶¼	....
Woodall Gas Co., Blumly 1	¶¼	....
WETZEL COUNTY—		
Manufacturers Light & Heat Co., Main 2	25	....
Philadelphia Oil Co., Pettitt & Co. 5	*	....
WOOD COUNTY—		
Ekas & Gordon, McDougal 2	*	....
L. B. Galbraith & Co., Foley 1	5	....
KANAWHA COUNTY—		
United Fuel Gas Co., Bodkin 4021	¶1¼	....
Brown-Swan 4019	¶1½	....
MARION COUNTY—		
Carnegie Nat. Gas Co., Wells 1	¶¼	....
Owens Bottle Machine Co., Michaels 1	¶2	....
CALHOUN COUNTY—		
Richter Oil Co., Haught Hrs. 3	10	....
DODDRIDGE COUNTY—		
A. C. Garner & Co., Gatner 1	5	....
PLEASANTS COUNTY—		
Tait Bros. & Co., Dye 29	3	....
CABELL COUNTY—		
Hamilton Gas Co., Beckett 3	¶¼	....
LINCOLN COUNTY—		
Empire State Gas Co., Sweetland 14	¶¼	....
TYLER COUNTY—		
American Oil Co., McCoy 3	¶¼	....
PUTNAM COUNTY—		
J. V. Reishman, Grass 2	¶1½	....
MARSHALL COUNTY—		
Manufacturers Light & Heat Co., Evans 3396	¶1½	....
HARRISON COUNTY—		
Delaware Gas Co., Davis 1	¶1½	....
LEWIS COUNTY—		
J. W. Wilson & Co., Exchange Bank 1	*	....
GILMER COUNTY—		
Hope Construction & Ref. Co., Hardman 1	*	....

NORTH LOUISIANA

DE SOTO PARISH—		
Magnolia Pet. Co., Anna Mason 1, 27-12-11	*	3321
OUACHITA PARISH—		
Magnolia Pet. Co. U. S. Govt. 4, 20-19-5e	¶¼	2290
RICHLAND PARISH—		
W. C. Feazel, E. L. Wilson 1, 31-16-6e	¶50	2445

SOUTH LOUISIANA

BLACK BAYOU—		
Shell, Watkins 12, wo	700	5237
EDGERLY—		
Strange Oil Co., Reed 1	50	3670
EVANGELINE—		
Yount-Lee Oil Co., C. O. & M. Co. 5	*	4550
STARKS DOME—		
Tex. Gulf Sulphur Co., Lutcher-Moore 9	*	1575
VINTON—		
Gulf, Star-Vincent 49	120	2420

EAST CENTRAL TEXAS

VAN ZANDT COUNTY—		
Pure Oil Co., A. F. Magers 1	2500	2863
Shell Pet. Corp., E. L. Fowler 1	10,000	2699

TEXAS GULF COAST

Company, Well and Location	Initial Production Bbls.	Depth
BARBERS HILL—		
Mills Bennett Prod. Co., Means 2	1750	5137
HULL—		
Humble, Guedry 25	300	3754
HUMBLE—		
The Texas Co., Dunman 2	425	5360
LOST LAKE—		
Pure, Mayes 6-A	*	3290
Mayes 4	*	2818
RACCOON BEND—		
Humble-Valley, Austin College 5	15	2998
Jackson 3	390	3379
REFUGIO—		
Rutherford-Traylor Oil Co., Blk. 92, No. 1	860	3695
Blk. 77, No. 1	850	3705
Morgan Oil Corp., City 4	800	3706
Heap, Rutherford 1	2200	3674
Independent O&G Co., West 2	700	3677
SPINDLE TOP—		
Yount-Lee Oil Co., Gladys City 18	*	3413
McFaddin 55	1200	3352
McFaddin 122	¶40	4865

SOUTHWEST TEXAS

DARST CREEK—		
Clemens-Trinity Drillers, Miller 1-B	500	2621
Humble, Denman 4-A	1200	2579
Denman 7-A	1080	2593
Empire, Dowdy 3-A	230	2638
Gulf, Dix-McKean 2	1200	2572
Posey 3	410	2567
The Texas Co., Dowdy 1	75	2650
L. Anderson 4	300	2670
BASTROP COUNTY—		
Johnson Bros., Cox 1	*	2000
BEE COUNTY—		
Houston Oil Co., McKinney 1	500	3971
The Texas Co., Tipps 3	*	1000
BROOKS COUNTY—		
Houston Oil Co., Holbein-Wormser 1	200	4145
CALDWELL COUNTY—		
Stone et al, Quinn 2	*	2300
Malcolm & Keene, McNeill 1	*	900
DE WITT COUNTY—		
McIntyre et al, Von Roeder 1	*	1480
DUVAL COUNTY—		
Allied Gas Co., Bruni 1	¶30	2269
Peters 1	¶30	1759
Long, Hahl 4	40	2312
GOLIAD COUNTY—		
Compton & Co., A. T. Fromme 1	*	....
GONZALES COUNTY—		
Joe Bruner, Miller 1	*	3490
Ferrel & Elam, Robinson 1	*	....
Green et al, Dix 1	*	....
JIM HOGG COUNTY—		
Deep Rock Oil Co., Kelsey 1	*	....
Randado Oil Co., Palacios 35	*	100
MAVERICK COUNTY—		
Rycade Oil Corp., Chittim 5	*	3442
ZAPATA COUNTY—		
O. W. Killam, Cuellar 19	500	1537

EAST TEXAS

PANOLA COUNTY—		
Nemours Corp., Brumble 4, E. F. Mitcheson sur	¶1¼	2340
OUICHITA COUNTY (Smackover)—		
Standard Oil Co., Powell 10, 34-15-15	2	2025
UNION COUNTY (Champagnolle)—		
Ohio Oil Co., J. M. Gregory 1, 1-17-14	100	3014

WEST VIRGINIA

CARSON COUNTY—		
McMan O&G Co., L. C. McConnell 1	125	3305
The Texas Co., J. L. Noel 3	265	3280
J. K. Quinn 3	175	3092
GRAY COUNTY—		
F. W. Dillard et al, Furneaux-Wilson 1	60	3475
Guernsey Oil Co., M. C. Vaniman 1	60	3291
Magnolia Pet. Co., J. E. Wright 3	¶4½-7000	2848
Operators Oil Co., J. B. Bowers 3	¶5	2819
HUTCHINSON COUNTY—		
Reliance O&G Co., Sanford 2	¶10-50	2938
Smith & McDaniel, Pitcher-Hill 1	240	3177
WHEELER COUNTY—		
Northern Texas Utilities Co., A. H. Finley 1	¶8	1904

Look in the NEW PLANTS for CLARK *Double Acting* "SUPER 2s"

The correctness of CLARK design—the staunchness of CLARK construction—the efficiency and economy of the CLARK "Super 2" in both single and double acting types—have been so widely demonstrated that in new plants you usually find CLARK engines.

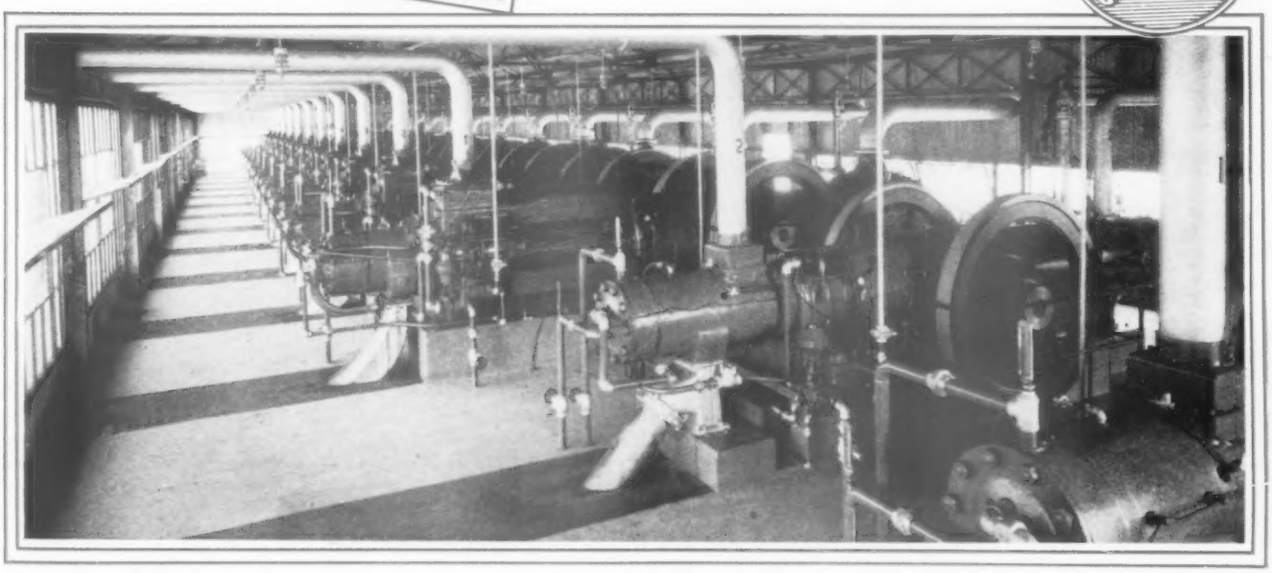
The photographs show the construction of the Humble Oil & Refining Company's gasoline plant in the Yates Field, near McCamey, Texas—with two 80 H. P. Clark 2-cycle machines and twelve 200 H. P. Double Acting "Super-2s". Three more 200's are now being installed.

CLARK BROS. COMPANY

OLEAN, N. Y.

Export Office: 150 Broadway, New York
Mid-Continent Sales Offices: Tulsa and Ft. Worth.
Warehouses: Tulsa, Okla.; McCamey and Sweetwater, Texas; Artesia, N. M.
California: Smith, Booth, Usher Co., 228 S. Central Ave., Los Angeles.

Compressors and Gas Engines



CLARK

NORTH TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
ARCHER COUNTY—		
J. F. Bailey et al, Brown 1	25	1292
T. F. Hunter et al, Kunkel 1-B	85	1165
Perkins & Cullum, Richardson 1-A	*	1350
Mel Richards et al, Young 2	30	1420
BAYLOR COUNTY—		
Consolidated Oil Co. et al, Portwood 8	85	1408
WICHITA COUNTY—		
Bridwell Oil Co., McFall 1	*	1837
Coleman & Coppock, K. & K. 22	40	1775
W. H. Hammon et al, Mitchell 1-B	10	1384
Humble O&R Co., Taylor 20	*	1847
WILBARGER COUNTY—		
Empire Gas & Fuel Co., Waggoner 22-A	75	2315
Lido Oil Co., Waggoner 2-C	260	2693
Waggoner 4-C	300	2725
Zenith Oil Co., George 2	2400	2217
YOUNG COUNTY—		
Bolin & Lindsey, Wolf 1	125	894
Wolf 5	70	895
Carey & Martin, Hill 1	*	1094
Humble O&R Co., Hightower 1	*	1354
Panhandle Ref. Co., Taack 1	*	855
Paull Oil Co., Allen 7	*	2270
Wise & Jackson, Miller 2	*	702
D. L. Wolf et al, Hill 3	25	1029
Womac Oil Co., S. Roach 1	80	737

CENTRAL WEST TEXAS

BROWN COUNTY—		
Darby Pet. Corp. and Gulf, Belvin 7	50	1313
Powell et al, Gaines 1	*	1270
E. L. Smith Oil Co., George 24	*	1315
CALLAHAN COUNTY—		
Holden & DeLange, Johnson 1	*	1700
Renaud & Prettyman, Johnson 1	*	1167
Transcontinental Oil Co., Bowman 1	*	1802
Union Oil Co. of Nevada, Alexander 2	20	1011
COLEMAN COUNTY—		
Gault-Brown & Co., Stewardson 2	*	2011
Walter Gray et al, G. M. Gray 1	1½	1670
Kidney-Hammon and Western Explo. Co., Pfluger 2	35	1526
Lloyd Oil Corp., Bartholomew 6	215	1434
Magnolia Pet. Co., Morris 11	*	2086
Permian Oil Co., Reeves 1	5	788
Simmons & Jones, Baker 1	*	1390
COMANCHE COUNTY—		
Jarvis et al, Lindley 4	20	2725
EASTLAND COUNTY—		
Stalker Oil Co., Holcomb 2	*	1607
ERATH COUNTY—		
Haynes et al, Meyers 1	*	3578
PALO PINTO COUNTY—		
Gordon & Gholson, Taylor 1	*	4800
SHACKELFORD COUNTY—		
Cranfill-Reynolds Co., Mathews 3	†	773
Grisham-Hunter Corp., Davis 6	10	1653
Mid-West Explo. Co., Dyer 6	15	903
S. B. Owens, Inc., et al, Morris-Buie 3	*	1710
Walter H. Rittersbush et al, Nail 2	*	1250
STEPHENS COUNTY—		
Byers O&G Co., Sudderth 1	*	2100

WEST TEXAS

CRANE COUNTY—		
Gulf Prod. Co., McElroy 71	305	2989
Church-Fields-Weekly Oil Corp., University-Dewell 5	200	3015
GLASSCOCK COUNTY—		
Kirkby Pet. Co. et al, Baker 3	700	2275
World Oil Co., L. C. McDowell 2-C	60	2453
HOWARD COUNTY—		
Gulf Prod. Co., Clay 10	200	1848
Moody Corp., Roberts 21-E	60	2680
The California Co., Roberts 5, Lse 1	*	3233
PECOS COUNTY—		
California Co., Smith 6, Sec. 21	2000	1713
Smith 6, Sec. 37	50	1526
Humble O&R Co., Smith 13	1560	1470
Landreth Prod. Corp., University 3-F	60	984
REAGAN COUNTY—		
Big Lake Oil Co., University 171	125	2878
UPTON COUNTY—		
Pure Oil Co., Hughest 4	45	2350
WARD COUNTY—		
Grand Falls Oil Co., Townsite 1	40	2186

NEW MEXICO

LEA COUNTY—		
Empire Gas & Fuel Co., State 3-B	*	4695
The Texas Co., State 1-B	225	3790

(Continued from page 76)

refinery constructions. Standard Oil Company (Indiana) has installed a lot of new equipment at Casper; Continental Oil Company has replaced obsolete stills at Glenrock, and the White Eagle Oil & Refining Company has converted a number of stills for the handling of black oil.

Entrance of the Standard Oil Company of New York into the Rocky Mountain region by taking over the White Eagle Oil & Refining Company's works at Casper is said to presage a market struggle for supremacy in the Rocky Mountain trade territory with Standard Oil Company (Indiana) through its subsidiary, Midwest Refining Company, and the Standard Oil Company of New York competing with Continental Oil Company, which has been strongly intrenched in the Mountain States for years as a marketer of refinery products.

Colorado

Colorado did not make a spectacular showing in the year, although it had a number of interesting minor developments. There was a small discovery of oil near Berthoud in Larimer County, with a gas discovery on the Piceance structure in Rio Blanco County and an extension of the Hiawatha district for gas in the northern part of the state. There was an extension of Wellington pool, but not very important. In the southeastern section of the state the Helium Company has seven wells from which it is manufacturing helium and shipping it to the United States navy at San Francisco.

Several natural gas propositions were under way at the close of the year in Colorado. A line is projected from Berthoud to Greely by the Standard Oil Company of Colorado and the Fulton interests of Montana have a franchise for the laying of a line from the Garmesa structure to Grand Junction. Cities Service Company laid a line to Loveland and Boulder within the year. Several minor gas propositions were under way or under consideration at the close of the year.

New Mexico

Drilling operations in New Mexico in 1929 were quite active, especially in wildcat work. Valuable discoveries and extensions were made in Lea and Eddy Counties where most of the drilling in the state is now under way. The Lynch pool is a new field opened in New Mexico within the year. The average depths of the wells are around 3700 feet and the oil tests 32 gravity with no gas. The Hobbs pool is also another new field in Lea County. The oil in this pool tests better than 35 gravity. The Eunice pool was also proved for oil in the year. It is also in Lea County, north of the Cooper and Jal areas and south of Hobbs High.

Several towns in the state were supplied with gas in the year and five companies are now competing with each other for a franchise for Albuquerque. There are vast quantities of natural gas proved and shut in in New Mexico awaiting a market.

Utah

Utah is credited with eight completions in the year, all dry holes. There are more than a dozen wells under way in the state at the beginning of the new year. An unique operation in the state is a test at Farnham dome where the Carbon Dioxide & Chemical Company of Seattle is seeking to develop a supply of carbon dioxide gas for the manufacture of "dry ice."

Idaho

Idaho has half a dozen tests under way and had two wildcats abandoned in the year. Pocatello and several other towns in the state, however, are to be supplied with natural gas through an extension of the Wyoming-Utah line from Ogden, Utah.

Arizona, North Dakota and western Nebraska report only dry holes. South Dakota had three dry holes in the last year but has what appears to be its first commercial well, recently completed near Hot Springs. Its production is estimated at 25 barrels daily.

The total crude petroleum produced in the Rocky Mountain states in 1929 will approximate 26,570,000 barrels, divided among the several states as follows: Montana, 4,000,000; Wyoming, 18,750,000; Colorado, 2,320,000; New Mexico, 1,500,000. This was practically all light oil. There are more than a score of black oil fields that have been proved in the Rocky Mountain region, all shut in with the exception of three or four, some of them without even pipe line connection.

At the present time there is barely enough light oil to supply the refinery needs of the Rocky Mountain states so that it is anticipated that before the end of the year it will be necessary to draw on some of the black oil fields to meet the refinery requirements of the territory.

Gas Line to Serve Butte Now Assured

Butte, Montana. — It is definitely announced here that Hope Engineering Company and Moody-Seagraves interests will lay a pipe line from northern Wyoming to Butte to supply the Anaconda and Butte smelter with gas for industrial consumption and the cities of Butte, Anaconda and Helena with gas for both industrial and domestic consumption. A satisfactory supply of gas has been assured and work will start immediately on the line as soon as weather conditions will permit for construction work. Hope Engineering Company has had a corps of surveyors at work for some time and a preliminary survey has been completed. The line will be approximately 310 miles long and will not only supply the cities mentioned but a number of smaller places along the line. The cost of the entire system when completed is expected to be close to $20,000,000. The new enterprise will lead to an intensive drilling campaign in a number of fields in northern Wyoming and southern Montana to develop additional gas reserves.

NATIONAL TUBE COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH, PA.

PERMITS GRANTED FOR NEW WELLS

WEEKLY COMPARISON OF NEW WELLS

State—	Week ending Feb. 8	Previous week	Total this month	Total this Year	This week 1929	This month 1929	1929 Year Total
Arkansas	..	4	4	15	3	6	159
California	13	13	26	83	54	93	1,231
Louisiana	8	13	21	86	14	34	903
Kansas	13	19	32	93	21	38	1,079
Oklahoma	31	16	47	295	62	134	3,578
Texas	118	80	198	850	165	398	8,697
Total	183	145	328	1,522	320	704	15,647

CALIFORNIA

ELWOOD—Barnsdall Oil Co.'s Luton-Bell 12, 15-4-29.

KERN COUNTY — Nick Gerard Oil Co.'s Watkins 1, 28-26-18.

LONG BEACH—Commercial Oil Corp. Ltd's No. 1, 24-4-13. Shell Oil Co.'s Patton-Wilson 10, 29-4-12; Patton-Wilson 11, 29-4-12,

MT. POSO — Petroleum Securities Co., Gardner 2, 26-27-28.

ROUND MOUNTAIN—Superior Oil Co.'s Coffee 1, 1-28-28.

SUMMERLAND — George F. Getty, Inc.'s State Lease 16-21, 21-4-26.

SUNSET — Reservoir Hill Gasoline Co.'s Havenstrite 5, 17-11-23.

VENTURA COUNTY—Shell Oil Co.'s McGrath 2-B, 27-2-22; Thatcher 1, 35-2-22; Everett 1, 23-2-22; Cohn 2-1, 14-2-22.

OKLAHOMA

CADDO COUNTY—Magnolia.'s Niles 7, ne c se nw, 36-6n-10w; English Drilling Co.'s Gaffney 3, se c nw se, 31-6n-9w.

CARTER COUNTY—Carter Oil Co.'s Kalawana 1, ne c nw 30-1s-3w.

CREEK COUNTY—Transcontinental's Cubbie 1, se se sw, 19-17-8e; J. H. Wright estate, Cartwright la, cel sw, 19-17-11e; Franchot Oil Co.'s Scott 7, c nw se, 28-16-9e; J. J. Kearney, Knight la, ne se sw, 20-14-10e.

LINCOLN COUNTY — Magnolia, School land 1, se sw se, 16-14-5e.

MUSKOGEE COUNTY — Robert Bebb, Townlot 1, nwc sw ne ne, 34-15-18e; L. R. Kershaw, Fee 2, ne c sw sw se, 15-13-18e.

OKFUSKEE COUNTY—Champlin O & R, McGilbray 1, se ne ne, 18-12-11e.

OKLAHOMA COUNTY — Heenan, Coe et al, Cunningham 2, nw ne sw, 1-11-3w; J. C. Shaffer et al Jones Community 1, sw nw sw, 1-11-3w; ITIO Co., A. Brokaw 4, se ne ne, 13-11-3w; C. Brokaw 4, ne se ne, 13-11-3w.

OKMULGEE COUNTY — D. M. Logan, Clarkson 1, cwl ne sw, 32-15-13e; J. E. Wallace, Colbert 11, csl sw ne, 14-14-14e.

OSAGE COUNTY—Vacuum Oil Co., 5 nw ne se, 15-26-6e.

PAWNEE COUNTY—Shaffer O & R, Jones 1, sw c ne, 22-20-5e; Foster Pet. Co., Little 9, ne sw nw, 6-20-8e.

PAYNE COUNTY—Mulberry Oil Co., Ballard 5, swc, 32-18-4e.

POTTAWATOMIE COUNTY — Magnolia, Tarter 1, sw nw sw, 15-7-4e, (otwdd); Independent O & G and Mid Kansas O & G Weldfelt 4, nwc, 2-7-4e; ITIO Co., Brandenburg 3, nw sw sw, 35-8-4e; Independent, Knappenburger 10, sw nw ne, 8-9-5e.

SEMINOLE COUNTY—Independent, Johnson 1, c ne ne, 33-9-8e; J. A. Hull, Anderson 1, nw sw sw, 9-8-7e; McCulloch Oil Co., Snyder 1 (owdd), se sw ne, 8-6-8e; Champlin Oil & Refg and Shell Pet., Sachemeche 5, sw se sw, 9-6-6e; Harris et al, Roberts 1, nw ne nw, 16-6-6e.

STEPHENS COUNTY — Empire, Miller 3, sec ne ne (owdd) 5-2s-8w; Sykes and Fossett, Blake 2, nwc ne nw se, 16-1s-8w.

KANSAS

BARBER COUNTY—Barbara Oil Co., Alexander 2, c nw nw, 24-33-13w.

BUTLER COUNTY—Lario Oil & Gas Co., Nixon 1, sw nw se, 23-27-5e.

COWLEY COUNTY—Mission Oil Co., Martin 2, csl n½ nw nw, 21-31-6e.

GREENWOOD COUNTY — Empire Oil & Refg., Patterson 8, "C", se c, 36-23-11e.

McPHERSON COUNTY — The Texas Co., Stuckey 2, nw ne sw, 10-21-3w; Shell Pet., Stuckey 5, nw sw se, 9-21-3w; Derby Oil Co., Stucky 7, sw ne se, 9-21-3w; Derby Oil Co., Stuckey 6, se nw se, 9-21-3w; Derby Oil Co., Stucky 5, sw nw se, 9-21-3w.

RENO COUNTY — M. M. Valericus et al, Fields 1, ne se nw, 6-26-7w.

SCOTT COUNTY — Dry Lake Enterprise Co., Peters 1, c nw, 16-20-31w.

SEDGWICK COUNTY—Shell Pet., et al, Brown 1, cnl se se sw, 15-26-2e; Shell Pet., Stollie 1, sw ne sw, 11-26-2e.

TEXAS

Operator, Lease or Owner, Acreage, Well, Survey, Distance to lease lines or well.

ARCHER COUNTY—Consolidated Oil Co., Wichita Falls, H. F. Harmol, 80, 1, 2490 TE &L sur, 150 ft from n and e lines. Shappell Oil Co., Wichita Falls, R. O. Prideaux, 64, 14, J. Dorsey sur, 1050 ft from w and 36 ft from n line. Pandem Oil Corp., Wichita Falls, J. A. Young, 40, 5, 2426 TE&L sur, 300 ft w of No. 4. Continental Oil Co. & Cullum, Wichita Falls, F C S L, 100, 5, Falls, CSL sur, 3104 ft from s and 990 ft from e line Blk. 9; 6, 3104 ft from s and 690 ft from e line Blk 9. Golding & Cochran, Wichita Falls, H. Harmel, 66, 3, W. E. Probert sur, Blk. 25, 150 ft from s and ne lines. W. D. Cline, Wichita Falls, L. M. Hayter, 100 2, 2423 TE&L sur, 150 ft from e and 1170 ft from s line sec. G. R. Ridgeway, Wichita Falls, D. W. Jackson, 160, 1, J. T. Ellard sur, 1200 ft from n and 1050 ft from w line. E. B. Maddon, Olney, W. H. Portwood, 40, 2, 2411, TE&L sur, 300 ft e of No. 1.

ANDREWS COUNTY—Deep Rock Oil Co., Fort Worth, A. R. King, 640 1, Sec. 11, School sur, 330 ft s of center of n line sec. W. J. Mathis, 640, 1, Sec. 4, School sur, 990 ft from s and w lines of sec.

ATASCOSA COUNTY—A. T. Brock, Somerset, F. Fowler, 108, 1A, No. 274 J. T. White sur, 1645 ft from w and 1030 ft from s line.

BROWN COUNTY—Venmex Oil Co., Wichita Falls, G. T. Butler, 49, 2, T. Benson sur, 450 ft from w and 150 ft from s line. Phillips Pet. Corp., Bartlesville, Okla., A. Williams, 100, 1, S 792, J. Beck sur, 1250 ft from w and 625 ft from n line. Arcadia Ref. Co., Brownwood, 32, 1, S 632, J. A. Wright sur, 150 ft from n and 1556 ft from w line. R. L. Umberhaur, Fort Worth, J. E. Hill, 130, 4, No. 602 Wm. Hays sur, 150 ft w of center of e line.

CALLAHAN COUNTY—Mid-Tex O&G Co., Abilene, T. Windham, 90, 1, S 371, G. W. Denton sur, 300 ft from w and 660 ft from s line ne¼. Mock-Texas Oil Co., Fort Worth, W. T. Wilson, 24, 1, B 83, CCSL sur No. 181, 150 ft from n and e lines. Moutray Oil Co., Abilene, P. G. Hatchett, 320, 4, S 20, D&D Asy. sur, 2220 ft from e and 150 ft from s line sec.

COLEMAN COUNTY — Reeves, Riley & Reeves, Coleman, M. F. Rude, 40, 1, S 246, T. Moffitt sur, 150 ft from n and w lines. Greene Prod. Co. & Chapman, Fort Worth, P. Barton, 26, 1, S 92, E. T. Ry sur, 2790 ft from n and 150 ft from w line. Fox & Adams, Burkett, J. C. Watson, 50, 13, No. 163 Wm. Mason sur, 150 ft from e and 450 ft from s line.

CHAMBERS COUNTY—Pure Oil Co., Fort Worth, W. F. Mayes, 10, E. H. R. Wallis sur, 187 ft sw of No. 1. Sun O'l Co., Beaumont, J. F. Wilburn 65, 4, Wm. Hodge sur, 100 ft w of No. 1.

COMANCHE COUNTY — Corvette Oil Corp., Fort Worth, L. Poteet, 160, 3, S 45, D&D Asy. sur, 250 ft from s and w lines nw¼ of nw¼.

CRANE COUNTY—Church & Weekly, Fort Worth, Duell, 80, 6, S 39, D 30, Univ Lands sur, 330 ft from n and w lines of e½ of sw¼.

DUVAL COUNTY—Humble, Houston, Kohler, 42A, S 171, J. Pointevent sur, 495 ft from s and 165 ft from w line.

EASTLAND COUNTY—Lone Star Gas Co., Dallas, W. H. Grove, 200, 5, S 487, S. P. Ry. sur, 1345 ft from n and w lines of sec. Southern Oil Prod. Co., Eastland, J. E. Chesley, 80, 1, S 384, S. P. Ry. sur, 660 ft from s and w lines. Anna Belle Oil Co., Cisco, E. M. Paschall, 24, 1, S 80, B 4, H&TC sur, 344 ft from w and 450 ft from s line. Lone Star Gas Co., Dallas, J. O. Calvert, 40, 2, lot 9, McL. CSL sur No. 2, 820 ft from n and 663 ft from w line.

ECTOR COUNTY—Landreth Prod. Corp., Fort Worth, University T, 160, 2, Sec. 3, Blk 35, 330 ft from s and e lines. Humble, Wichita Falls, R. L. York, 320, 2, S 16, B 44, T&P sur, 970 ft from n and 440 ft from w line sec; 3, 660 ft s of No. 2. A. Kloh, D., 320, 2, S 7, B 44, T&P sur, 2318 ft from n and 440 ft from w line sec.

EDWARDS COUNTY—Phillips Pet. Corp., Bartlesville, Okla., A. G. Helman, 2, S 25, CCSD&RGNG sur, 330 ft from n an de lines of se¼.

FORT BEND COUNTY—Navarro Oil Co., Houston, H. Hausler, 205, 4, B 37, D. Wickson sur, 200 ft w of No. 3.

FISHER COUNTY—Cranfill & Reynolds, Cisco, H. D. Johnson, 160, 1, S 3, Blk. R, W. E. Richardson sur, 440 ft from n and 1540 ft from w line of section 3.

GUADALUPE COUNTY—Gulf Prod. Co., Houston, Dix-McKean, 81, 3, P. R. Robinson sur, 150 ft s of center of n line. J. S. Abercrombie Co. & Harrison Oil Co., Houston, T. Dix, 20, J. R. Robinson sur, 3000 ft n of No. 1; 5, 300 ft n of No. 3; 6, 300 ft n of No. 2. L. C. Turman, Fort Worth, L. G. Denman, 100, 1, J. A. Miller sur, 150 ft from n and w lines. Sun Oil Co., Dallas, C. Knobloch, 75, 5, J. W. Robinson sur, 763 ft from sw and 150 ft from se line. Texas Co., Houston, Knobloch, 75, 1A, J. D. Robinson sur, 450 ft from e and 150 ft from s line. Knobloch, 75, 2B, J. D. Robinson sur, 150 ft from n and 450 ft from e line; 3B, 779 ft from w and 150 ft from s line. P. Roamel, 53, 3, J. B. Robinson sur, 150 ft from s and e lines.

HARRIS COUNTY — Navarro Oil Co., Houston, F. F. Dooley, 53, 18, J. Hamilton sur, 230 ft w of No. 17. Rio Bravo Oil Co., Houston, Fee, 22, 1, W. B. Adams sur, 200 ft from n and 50 ft from w line of Blk. 4. Pure Oil Co., Fort Worth, Hermann, 12, 2, No. 44 J. Kopman sur, 325 ft from e and 25 ft from n line.

HENDERSON COUNTY—Cranfill & Reynolds, Dallas, J. A. Young, 40. J. B. Broom, 100, 1, S. Chears sur, 1350 ft from n and 150 ft from w line.

HUTCHINSON COUNTY — Phillips Pet. Corp., Bartlesville, Okla., D. Trammell, 80, 1, S 38, B Y, A&B sur, 330 ft from e and 990 ft from s line w½ of nw¼. R. F. Cheatham,

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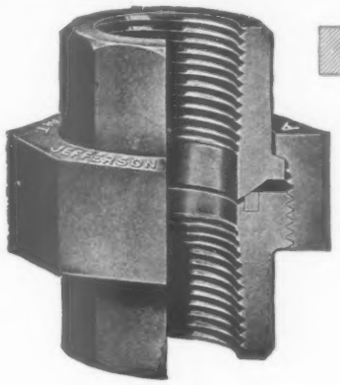

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Lunkenheimer products carried by Norvell-Wilder include Valves of Bronze, Iron, Steel and Acid Resisting Alloys: Gate, Globe, Angle, Cross, Check, Non-return, Blow-off, Pop Safety and Relief Valves, Water Columns, Water Gauges, Gauge Cocks, and Fusible Plugs, Lubricators and oiling devices, Whistles, Cocks, Unions, Fittings, etc., made in all standard sizes for all prevailing pressures and temperatures.

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The Lucey Type E-6000 Swivel for deep well drilling embodies all of the latest features of Swivel design and improved engineering practice. This has been the result of observations and experience of actual service in the field. Its service demands that it be made of the finest materials and workmanship, perhaps more so than any other piece of rotary drilling equipment. In describing the details of this swivel, particular attention is called to its simplicity and the small number of parts used in its construction. There are no small parts inside of the bearing case to come loose and foul the bearings.

Norvell-Wilder *Supply Company*

BEAUMONT HOUSTON SHREVEPORT FORT WORTH

40, 2, S 38, B Y, A&B sur, 330 ft from n and w lines of se¼ of se¼.

JACK COUNTY—Waggoner & Goxe, Wichita Falls, J. W. Maxey, 20, 1, J. W. Maxey sur, 150 ft from n and e lines. F H E Oil Co. & Kimbell, Sherman, R. L. Boyd, 72, 1, SFIYY sur, 150 ft from s and w lines.

JEFFERSON COUNTY — Yount-Lee Oil Co., Beaumont, McFaddin, 124, P. Humphreys sur, 95 ft from w and 816 ft from n line, Blk. 28; 125, 2410 ft from w and 660 ft from n line Blk. 28. Corrected location. Gladys 99, J. A. Veatch sur, 108 ft from s and 80 ft from e line Blk. 163B. Gulf Houston, E. Thomas, 395, 13, W. H. Smith sur, 950 ft from s and 100 ft from e line.

LIBERTY COUNTY — Empire G&F Co., Wichita Falls, Barngrover 37, 31, J. Devore sur, 275 ft from s and 100 ft from e line. Cranfill & Reynolds, Dallas, Esperson 660, 7, Sec. 24, C. W. Fisher sur, 300 ft se of No. 6. H. S. Smith, Inc., Houston, Brown & Tadlock, 2, 1, Sec. 125, H&TC sur, 50 ft from n and w lines. Texas Co., Houston, Barrow, 17, 1, J. Devore sur, 50 ft from n and 75 ft from e line.

MENARD COUNTY—C. G. Cromwell, San Angelo, R. S. Winslow, 160 2, S 36, T&NO sur, 250 ft from n and w line of ne¼.

NUECES COUNTY—South Texas Prod. Co. & Allied Gas Co., Laredo, Chapman, 183, 1, J. N. Rees sur, 660 ft from n and e lines.

PECOS COUNTY—Shell Pet. Corp., Wichita Falls, Smith, A, 640, 12, S 27, B 194, CG&SF sur, 990 ft from n and 1819 ft from e line sec; 13, same sur, 2970 ft from n and 3060 ft from e line sec; 14, same sur, 2970 ft from n and 1740 ft from e line sec. Smith, B, 40, 2, Sec. 24, B 194, GC&SF sur, 330 ft from n and e lines of sec. M. A. Smith, D, 320, 5, S 24, B 194, GC&SF sur, 990 ft from s and e lines of sec. Bower, D, 40, 1, S 32, B 16, SUL sur, 330 ft from s and e line of nw¼ of sw¼.

REFUGIO COUNTY—W. L. Pearson Properties, Inc., Corpus Christi, Ryals, 52, 1, Refugio sur, 194 ft from w and 167 ft from n line Lot 2. Independent Oil & Gas Co., Refugio, Mercy Academy, 50, 1, Refugio sur, 167 ft from n and 250 ft from e line. H. Reilly, 40, 1, Blk 3, Refugio sur, se corner of lot 16. Houston Oil Co., Houston, Shelton, 1, Blk 100, Refugio sur, 155 ft from w and 150 ft from s line B 100. E. Dorsey, 1, Refugio sur, 170 ft from n and 166 ft from e line Blk 78. J. O. West, 1, Refugio sur, 150 ft from n and 110 ft from e line Blk 67.

SHACKELFORD COUNTY—Midwest Exploration Co., Amarillo, J. F. Dyer, 80, 6, S 85, B 12, T&P sur, 450 ft from e and 150 ft from n line e& ne¼.

THROCKMORTON COUNTY — Wilson & Swain, Doodson, J. T. Odell, 40, 2, 696, TE&L sur, 150 ft from w and 466 ft from n line; 3, same sur, 150 ft from n and w lines; 4, same sur, 150 ft from s and 450 ft from w line; 6, same sur, 150 ft from n and 450 ft from w line. C & B Oil Co., Breckenridge, J. T. Odell, B, 40, 4, S 696, TE&L sur, 466 ft from n and 450 ft from w line survey. J. T. Odell, A, 80, 6, S 695, TE&L sur, 1400 ft from n and 150 ft from e line sec. Meador & Whitney, Breckenridge, A. J. Wright, 40, 1, 2232, TE&L sur, 150 ft from e and 450 ft from s line sec. C. C. Williams, Joan, G. C. Eaton, 80, 2, 689, TE&L sur, 300 ft s of No. 1. Ewmo Oil Corp., Abilene, J. E. Hughes, 40, 6, 902, TE&L sur, 783 ft from n and 150 ft from w line e½ ne¼; 7, same sur, 150 ft from n and 450 ft from e line sec. Webb & Gaskill, Breckenridge, G. Eaton, 41, 1, 689, TE&L sur, 150 ft from s and w lines of sec. Geo. Mollenkopf, Woodson, J. T. Odell, 40, 2, 396, TE&L sur, 1716 ft from e and 150 ft from n line sur.

WICHITA COUNTY—Arkansas Fuel Oil Co., Wichita Falls, Kemp & Kempner, A, 60, 25, B82, WVFL sur, 50 ft e of No. 1C; 26, B 81, WVFL sur, 50 ft e of No. 8. Kisk Oil Co., Wichita Falls, J. L. Waggoner, 5, 2, B 1, M. A. Willis sur, 50 ft w of No. 1. Arkansas Fuel Oil Co., Wichita Falls, Kemp & Kempner, 60, 26A, B 82, WVFL sur, 50 ft e of No. 5. Texas Co., Wichita Falls, W. T. Waggoner, A375, S 13, H&TB sur, 330 ft from w and 1215 ft from n line sec.

WILSON COUNTY—Tidal Oil Co., Fort Worth, F. Kuleza, 674, 1, No. 109, S. Larrison sur, 1320 ft from s and 2350 ft from e line.

WEBB COUNTY—Magnolia Pet. Co., Dallas, S. Benavides, 895, 6, S 174, B 7, P. Garza sur, 50 ft sw of No. 2. E. H. Buckner, Houston, R. Benavides, A1, S 15, B 5, M. Arispo sur, center of Blk 5.

WHEELER COUNTY—C. A. Linkey, 80, 3, S 106, B 23, H&GN sur, 660 ft from n and e line of e½ of ne¼. Fain-McGaha Oil Corp., Wichita Falls, I. Close, 6, S 78, B 23, H&GN sur, 660 ft from s and w lines of se¼.

WILLIAMSON COUNTY—G. B. Peterman, Taylor, J. C. Abbott, 1, S. Miller sur, 310 ft from e and 30 ft from s line.

YOUNG COUNTY—E. B. Lawson, Tulsa, Okla., J. A. Leberman, 40, 3, 151, TE&L sur, 330 ft ne of No. 1. Venmex Oil Co., Wichita Falls, J. M. Jones, 80, 1, S 25, TE&L sur, 150 ft from n and 30 ft from e line. United Prod. Co., Wichita Falls, J. A. Leberman, 40, 2, 151, TE&L sur, 300 ft e of No. 1. Petroleum Prod. Co., Wichita Falls, O. Deitrick, 60, 2, G. W. Stell sur, 750 ft from w and 150 ft from n line. Stump & Heydrick, Wichita Falls, J. B. Daniels, 40, 2, 164, TE&L sur, 450 ft from e and 150 ft from s line sec. D. L. Ward, Olney, E. Hill, 22, 4, 195, TE&L sur, 300 ft w of No. 2. King Royalty Co., Wichita Falls, C. F. Kunkel, 11, 4, S 4, BBB&C sur, 150 ft from s and w lines. C. C. Williams, Joan, C. J. Taack, 280, 1, 263, TE&L sur, 150 ft from n and e lines. Smith & nester, Wichita Falls, J. F. Bussey, 40, 1, sec. 2, sw corner of ne¼. T. G. Shaw Oil Corp., Fort Worth, J. Kisinger, 40, 2A, Jno. Conner sur, 165 ft from n and e lines. Madden & Hunt, Olney, O. Deitrich, 20, 2, G. W. Stell sur, 150 ft from n and 1412 ft from e line. Perkins & Cullum, Wichita Falls, E. Deitrich, 45, 6, G. W. Stell sur, 30 ft s of No. 3. Wooten & Reed, Graham, A. C. Casey, 40, 2, 1486, TE&L sur, 900 ft from w and 150 ft from n line. Wo-Mac Oil Co., Wichita Falls, Stevens 110, 2, S 1, BBB&C sur, 325 ft e of No. 1. E. R. Riggs, Graham, S. J. Allison, 89, 5, 150, TE&L sur, 1350 ft from n and 1340 ft from w line sur. Baker & Pardue, Breckenridge, H. M. Donnell, 147, 3, S 4, S.P. Ry sur, 1120 ft from w and 200 ft from s line.

LOUISIANA

ACADIA PARISH — Yount-Lee Oil Co., Beaumont, Tex., Crowley & Mineral Oil Co. 6, 48-9s-2w, 4790 ft e and 630 ft n of swc of Sec.

CALCASIEU PARISH—Texas-Gulf Sulphur Co., Vinton, La., Lutcher-Moore 12, 30-9s-12w, 500 ft s and 540 ft w of ne c nw.

CAMERON PARISH — Rycade Oil Corp., Houston, Tex., Gulf Land 5, 30-12s-10w, 960 ft s and 1645 ft e of nw c of Sec.

SABINE PARISH—Arkansas Fuel Oil Co., Shreveport, S. R. Horne et al 4, 33-10n-12w, 370 ft s and 450 ft w of center of Sec. G. M. LeGrand, Shreveport, E. Giaque 1, 6-7n-12w, 225 ft s and 225 ft e of nw c ne nw.

ST. LANDRY PARISH—Gulf Ref. Co. of La., Houston, Tex., Chas. Godet 3, 4-6s-5e, 500 ft n of Gulf Ref. Co. No. 2 Godet and midway between the E. & W. lines of Chas. Godet 72 acres.

ST. MARTIN PARISH — Yount-Lee Oil Co., Beaumont Texas, Hebert 2, 123-9s-5e, 585 ft e and 2645 ft n of se cor of Sec. 86 in Sec. 123.

UNION PARISH—Lyons Gas Co., Shreveport, Jones 2, 11-20n-3e, 1190 ft w and 138 ft s of ne c nw.

Konawa

Tulsa.—A new producer in the Konawa field southern Seminole County, Oklahoma, was the Independent Oil & Gas Company's Oyster 1, SE NE Section 8-6-6, which swabbed 641 barrels in 20 hours after being deepened three feet to 2890 feet. It was making 575 barrels later, with a trace of water. This well is considerably lower than the other producers and is the northmost well.

Another well on the north line, which is due to test soon, is the McCulloch Oil Company's Snyder 1, SE SW NE Section 8-6-6. It was opened up the past week and gauged only 3,000,000 feet of gas and soon dropped to 1,000,000 feet. It was being cleaned out to deepen to the oil producing horizon.

Oregon Basin Production From One Sand at Time

Cody, Wyoming.—According to a recent ruling of the United States Geological Survey, Department of the Interior, operators in the Oregon Basin field, 15 miles southeast from here, will not be allowed to produce oil from more than one sand in individual well in the future. The department has been cooperating with the producers in the prevention of water encroachment and claims that the water situation can be controlled by the new ruling as it will be easier to control the encroachment if the different producing sands are protected by setting casing and cementing off producing sands in the cases where higher horizons are cemented when drilling deeper to lower horizons. There is nothing in the new ruling to prevent operators going back into the higher producing horizons when the lower sands have been exhausted. Several of the more important companies have been observing the new requirements and have been taking cores before drilling into the sands and in the sands themselves. In all such cases they have not been bothered with water and the wells have been producing clean pipe line oil.

LaBarge Leases Sold

Kemmerer, Wyoming.—The Sackrider-Kuhlman interests are reported to have sold their holdings in the LaBarge oil field, 45 miles north of Kemmerer, to a syndicate of local operators who will organize a company to develop the newly purchased properties. The holdings taken over consist of several hundred acres, part of which is in proven territory, on which there are three wells with a daily production of approximately 250 barrels.

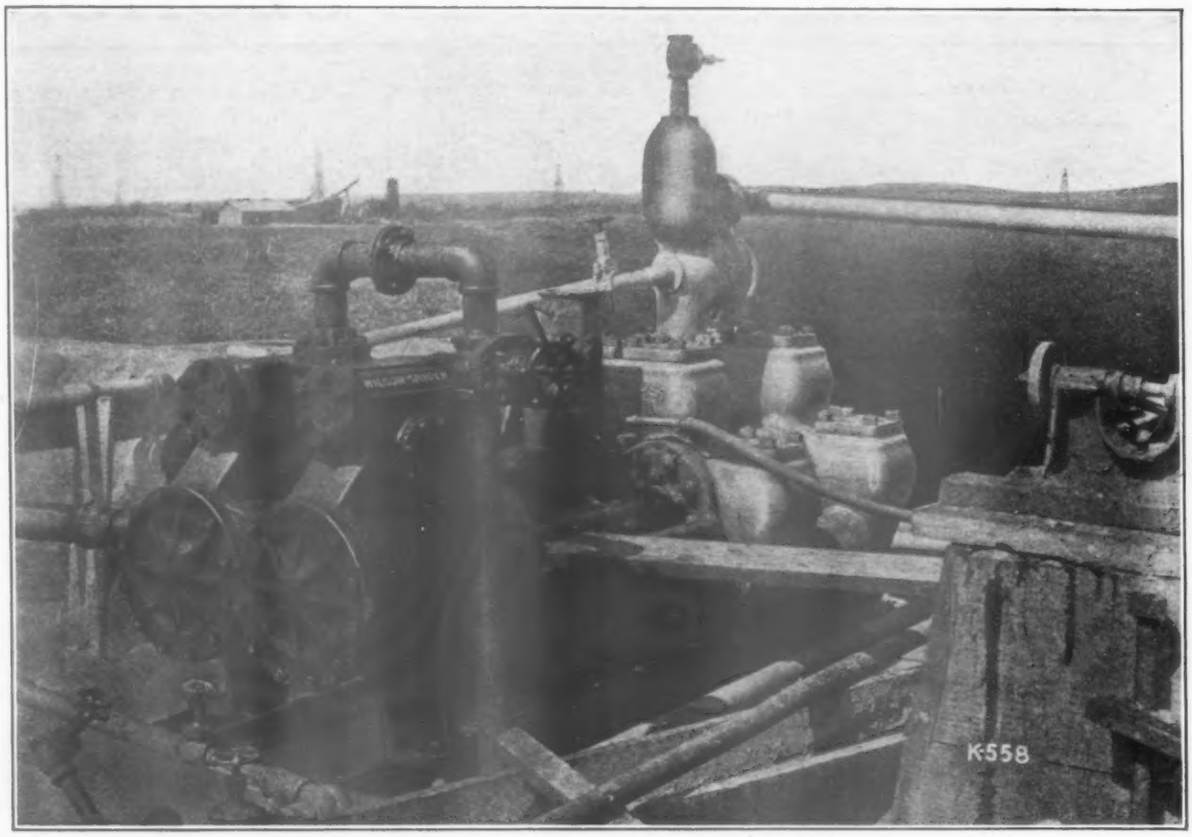
Louisiana Formations to Be "Standardized"

Shreveport, Louisiana.—A committee of five petroleum geologists was authorized at the February meeting of the Shreveport Geological Society here to standardize names of various geological formations found in Louisiana. President M. W. Grimm appointed H. K. Shearer and C. L. Moody to serve on this committee, these two to select their three collaborators.

An effort will be made to get as nearly a 100 per cent attendance as possible at the 1930 annual meeting of the American Association of Petroleum Geologists at New Orleans in March. The Shreveport society is in reality host to the convention. President J. Y. Snyder of the A. A. P. G. is a member of the local society.

At the February meeting of the local society Mr. Shearer read a paper entitled "Notes on Geology and Oil Prospects of Portions of Alabama and Mississippi."

Charles Stark, formerly tax agent for Shell Oil Company, has opened offices in Los Angeles and will handle matters pertaining to county and municipal taxes.



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Completions

PECOS COUNTY—		
Carl Cromwell & Harrison, White-Baker 1	*	1847
Independent O&G Co. et al, Phelps 1	*	2401
Kirby Pet. Co. et al, Belgrade 1	*	1625
Madza Oil Corp., Cordova 1	*	1804
WINKLER COUNTY—		
M. J. Bashara et al, Fee 2	45	3087

ANDREWS COUNTY—Deep Rock Oil Co. et al's King 1, rig; B. L. King 1, materials; W. J. Mathis 1, rig.

BORDEN COUNTY—W. A. Moncrief & Humble O&R Co.'s Munger 1, elev 2433 ft, top salt 1090 ft, co 2710 ft. Phillips Pet. Co. & C. B. Shaffer's Goode 1, lcn.

BREWSTER COUNTY—Ed. Bateman et al's Neville 1-A, dr 2898 ft. E. L. Chapman et al's Skinner 2, dr 1040 ft. Trans-Pecos Oil & Gas Co.'s A. A. Jones 1, dr 1725 ft.

COCHRAN COUNTY—R. A. Westbrook & Co.'s Slaughter 1, top lime 3837 or 4265 ft, dr lime 4660 ft.

COKE COUNTY—Mid-Kansas O&G Co.'s Lackey 1, elev 2152 ft, sd 4255 ft.

CROCKETT COUNTY — Empire Gas ½ Fuel Co.'s Shannon 1, elev 2691 ft, top salt 1130 ft, top lime 2468 ft, sd 2660 ft. Magnolia Pet. Co.'s Hoover 1, set 12½-inch cas 550 ft.

CULBERSON COUNTY — Grisham-Hunter Corp.'s Seay 1, dr 2330 ft.

ECTOR COUNTY—Cosden Oil Co.'s University 1-A, elev 2914 ft, top salt 1055 ft, top lime 3265 ft, flowing 100 bbls oil per hour and fsh tools in lime 3596-3654 ft; Kloh 1, lcn. C. P. Davis et al's T. G. Hendrick 1, spudding. Gulf Prod. Co.'s University 1, materials; University 1-A, materials. Humble-Penn-Atlantic's Kloh 2-D, R. L. York 2 and 3, rigs. Landreth Prod. Corp.'s University 2-S, rig. Llano Oil Co.'s T. S. Hogan 1, elev 2914 ft, top salt 1390 ft, set 8¼-inch cas 2600 ft. Penn Oil Co. & Devonian Oil Co.'s Goodman 1, lcn.

EL PASO COUNTY — Inter-Coastal Oil Co.'s Malone 1, sd 1340 ft.

FISHER COUNTY—Cranfill-Reynolds Co.'s Johnson 1, dr 530 ft. Magnolia's Alice Lee 1, elev 1827 ft, dr 4970 ft. Mid-Kansas & Phillips Pet. Co.'s Stephenson 1-A, elev 1919 ft, top lime 3228 ft, sd hfw 4136 ft. Roeser-Pendleton, Inc., & Amerada Pet. Corp.'s Waco Bank 1, elev 1779 ft, fsh 3161 ft.

GAINES COUNTY—Cranfill-Reynolds Co. & La. Oil Ref. Corp.'s Ralph 1, elev 3475 ft, top salt 1657 ft, testing show oil in lime 4351 ft.

GARZA COUNTY—H. C. Cate & Pandem Oil Corp.'s Stoker 1, sd 3018 ft.

GLASSCOCK COUNTY—Amerada's Coffee 2, dr 1675 ft. California Co.'s Currie 3, elev 2664 ft, pb from 3671 to 3523 ft; Jones 1, dk. Conoco's Hart Phillips 1, rig. FHE Oil Co. et al's Box 1, dk. Luna Oil Co.'s Edwards 1, elev 2548 ft, top lime 2155 ft, pb from sulphur water 2491 ft. Simms Oil Co.'s Coffee 2, testing 500 ft oil in hole 2175-2215 ft; Coffee 3, dr 1425 ft; Coffee 4, rig. Ed. Timberlake & M. Snyder's Meek 1, elev 2792 ft, dr 1460 ft.

HOCKLEY COUNTY — World Oil Co.'s Ellwood 1, elev 3363 ft, top salt 2127 ft, top lime 4570 ft, dr hard brown lime 4950 ft.

HOWARD COUNTY — Owen-Sloan et al (was Mays-Nixon et al's) Flowers 1, elev 2497 ft, co 2517 ft. Meriwether Oil Co.'s Eva Smith 1, dr 1930 ft.

HUDSPETH COUNTY — California Co.'s University 1, elev 5109 ft, fsh 3525 ft.

IRION COUNTY — Atlantic & Beasley's Sawyer 1, elev 2419 ft, dr 1695 ft. J. B. Crawford et al's Nutt 1, sd 1105 ft. Cromwell et al's Fuller 1-A, dr 1165 ft. Glenn et al's Tankersley 1, lcn. Irion Oil Co.'s Tankersley 1-A, sd 200 ft. Kingwood Oil Co. et al's Sugg 1, elev 2334 ft, sd after four shots, td 7818 ft. J. A. Starkweather et al (Concho Oil Co.'s) Lindley 1, dr 1905 ft. P. H. Williams et al's Ashe 1, elev 2726 ft, top lime 1712 ft, sd 7174 ft.

ABBREVIATIONS

NOTE—The following is the explanation of abbreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶K million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas—casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in.—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

JONES COUNTY — Continental Oil Co.'s Phillips 1, set cas 2918 ft, co 2927 ft. Mid-Tex. O&G Co.'s King 1, sd 1560 ft. F. E. Shaheen et al's King 1, elev 1629 ft, sd 2204 ft. W. S. Ware et al's Neuman 2, set cas 2340 ft.

KENT COUNTY—Atlantic Oil Prod. Co. Unit Plan's Wallace 1, elev 2253 ft, top salt 330 ft, dr 2340 ft.

LOVING COUNTY—California Co.'s J. G. Allen 1 and Reagan-McElvain 1, lcns. Hadlock et al's Ramsey-Russell 2-A, lcn. Lockhart & Co.'s Bowen-Wells 3, dk; Hubbard 5, dr 2380 ft; Lepp 2, spd and sd; Wheat 1-H, elev 2713 ft, top Deleware 4152 ft, top black lime 5025 ft, bad hole 5040 ft. Humble O&R Co. Unit Plan's Kloh 1-C, elev 2815 ft, top salt 1230 ft, dr by junk, td 3650 ft.

LYNN COUNTY—Hart Oil Corp. et al's Edwards 1, elev 3128 ft, top salt 2140 ft, sd 5035 ft.

MENARD COUNTY — Carl Cromwell & Duffy's Winslow 2, dr 420 ft.

MITCHELL COUNTY—Gibson-Johnson et al's Scott 3, set cas 560 ft. Magnolia's Snyder 1, dr 2640 ft. Teas & Wheeler's Radford 1, elev 2223 ft, dr plug 4818 ft.

NOLAN COUNTY—Gibson & Johnson's S. P. Boyd 1, elev 2126 ft, set 5-inch cas 3270 ft.

PECOS COUNTY—Atlantic Oil Prod. Co.'s W. T. Shearer 1, machine. Bateman & Co.'s Cordova 1, sd 1710 ft. M. H. Black et al's Pecos Valley 1, elev 2434 ft, dr 1110 ft. Buell-Hagan & Pope's Byrne 1, elev 2512 ft, sd after shot 1400 qts. E. L. Chapman et al's Streety 1, elev 2653 ft, ur 1712 ft. Cosden Oil Co.'s McDonald 1, elev 2459 ft, sd 2015 ft. Cranfill-Reynolds Co.'s Masterson 1-B, dr 430 ft. Dixie Oil Co.'s McKenzie 1, set 10-inch cas 888 ft. Fisher & Lowrie's R. D. Webb 1, lcn. Freeman & Miller's Pecos Valley 1, elev 2446 ft, top salt 1240 ft, sd 1710 ft. Geyer-Frates Inc., et al's Sellman 1, elev 2716 ft, top salt 830 ft, one million ft gas 1723 ft, sd in sulphur water 1860-70 ft. Humble O&R Co.'s Cunningham 2, dr 700 ft. Hussman Oil Co.'s Estes 1, dr 670 ft. Maych & Krogen's Holmes 1, sd 1510 ft. R. E. Moore et al's Arnold 1, elev 3860 ft, sd 1615 ft. J. D. O'Mara et al's Bennett 1, elev 2513 ft, sd 875 ft. Pecos Valley Oil Pur. Co.'s Pecos Valley 4, top salt 985 ft, dr 1270 ft. Perren et al's Eaton 1, lcn. Phillips Pet. Co.'s Byrne 1, dr 1045 ft. Sides & Cloyd's Blackstone-Slaughter 1, dr 430 ft. Southern Crude Oil Pur. Co.'s McKenzie 1, dr 897 ft. Stine & Griffith's McKenzie 1, elev 3156 ft. top salt 1330 ft, sd 1860 ft. Transcontinental Oil Co.'s University 1, elev 2552 ft, top lime 1035 ft, dr lime 4875 ft; White & Baker 2, rig. Trees Oil Co.'s Trees 3, sd hfw 1370 ft. World Oil Co.'s University 1-C, elev 2614 ft, run cas with hfw 1547-60 ft.

REAGAN COUNTY—Big Lake Oil Co.'s University 1-C, dr shale 8382 ft; University 2-C, flowed 601 bbls oil and 13,025,000 ft gas 8232 ft; University 3-C, dr shale 8506 ft; University 4-C, flowed 172 bbls oil and 4,442,000 ft gas 8220 ft. Group One Oil Corp. (Conoco.'s) University 2-B, fsh drill stem 5106 ft; University 3-B, dr by stem at 2980 ft, td 2990 ft.

REEVES COUNTY—Hansford et al's Williams 1, sd 380 ft. Slack & Fink's Brooks-Huling 1, sr 860 ft. White et al's Hersheusen 1, sd hfw 3575 ft.

RUNNELS COUNTY—Geo. W. Boyce et al's Lange 1, set cas 1605 ft. Gibson & Johnson's Johnson 1, dr 250 ft.

SCHLEICHER COUNTY — Delmar Oil Co.'s O'Harrow 1, dr 2110 ft. Eastland Oil Co.'s Tisdale 1, lcn. Phillips Pet. Co.'s J. A. Whitten 1, elev 2333 ft, sd 5870 ft. Munger-Wilson Oil Co.'s Page 1, elev 2270 ft, set cas 2041 ft.

SCURRY COUNTY—J. G. Armand & Camp Springs O&R Co.'s Quinn 1-A, elev 2316 ft, fsh 3805 ft. Byrd & Hamon's Murphy 1, sd 1732 ft. Pender O&G Co.'s Davis 1, sd 4325 ft. E. L. Smith Oil Co. & Magnolia's Mooar 1, elev 2519 ft, top salt 750 ft, dr 3480 ft. Transcontinental Oil Co. & Vacuum Oil Co.'s Peckham 1, spudded and sd.

TAYLOR COUNTY—Condor Pet. Co.'s K. Stocker 1, spudded and sd. J. B. Jameson et al's Webb 1, elev 1905 ft, dr 5325 ft.

TERRELL COUNTY—Big Bend Oil Corp.'s Bassett 1, elev 2396 ft, sd 1285 ft. Transcontinental's Goode 1, elev 2405 ft, dr 1690 ft. Keck Pecos Oil Trust's Hamilton 1, dr 3115 ft.

TERRY COUNTY—Penn Oil Co.'s Carlisle 1, lcn.

UPTON COUNTY—TP Coal & Oil Co.'s E. V. Belcher 1, ur 410 ft.

VAL VERDE COUNTY—Phantom Oil Co.'s Ingram 1, dr 2615 ft. O. O. Owens et al's Mills 1, sd 5550 ft.

WARD COUNTY—Alpine Oil & Dev. Co.'s Dakan 1, elev 2443 ft, top salt 890 ft, swab 30 bbls daily after shot, td 2210 ft. E. J. Anderson et al's Townsite 1, elev 2443 ft, top salt 815 ft, swab 20 bbls daily after shot, td 2183 ft. C. C. Dorr et al's Costley 1-A, elev 2493 ft, sd 1697 ft. Gulf Prod. Co.'s Hutchings 3, elev 2659 ft, top salt 1035 ft, co 2685 ft; O'Brien 7, elev 2653 ft, top lime 2460 ft, pb from 3566 to 3252 ft account flow of 700 bbls sulphur water per hour. Harrison Oil Co. & FHE Oil Co.'s Wristen 1, elev 2530 ft, top salt 715 ft, dr 3050 ft. Mid-Continent Pet. Corp.'s Conway 1, elev 2552 ft, top salt 880 ft, dr lime 3345 ft. Penn Oil Co. & Atlantic's Bennett 2, elev 2579 ft,tcp salt 2085 ft, top lime 2260 ft, re-cem cas 2340 ft; Cooper 1, elev 2609 ft, top salt 2430 ft, lowering cas 2782 ft. Shell Pet. Corp.'s Sloan-Owen 1, top salt 765 ft, dr 3655 ft. Shipley Oil Corp.'s Monroe 1-A, sd 385 ft. Sturm & Paine's Cummings 1, elev 2443 ft, top salt 810 ft, dr 1030 ft. Southern Crude Oil Pur. Co.'s Hill & Hill 1, spudding. Sun Oil Co.'s Sealy 1, elev 2680 ft, dr red beds 1905 ft. Tex-Oil Production Co.'s Redman 1-A, elev 2717 ft, top salt 1290 ft, dr 3665 ft.

WINKLER COUNTY—Sun Oil Co.'s Sealy 2, elev 2713 ft, dr 1545 ft.

EAST CENTRAL TEXAS

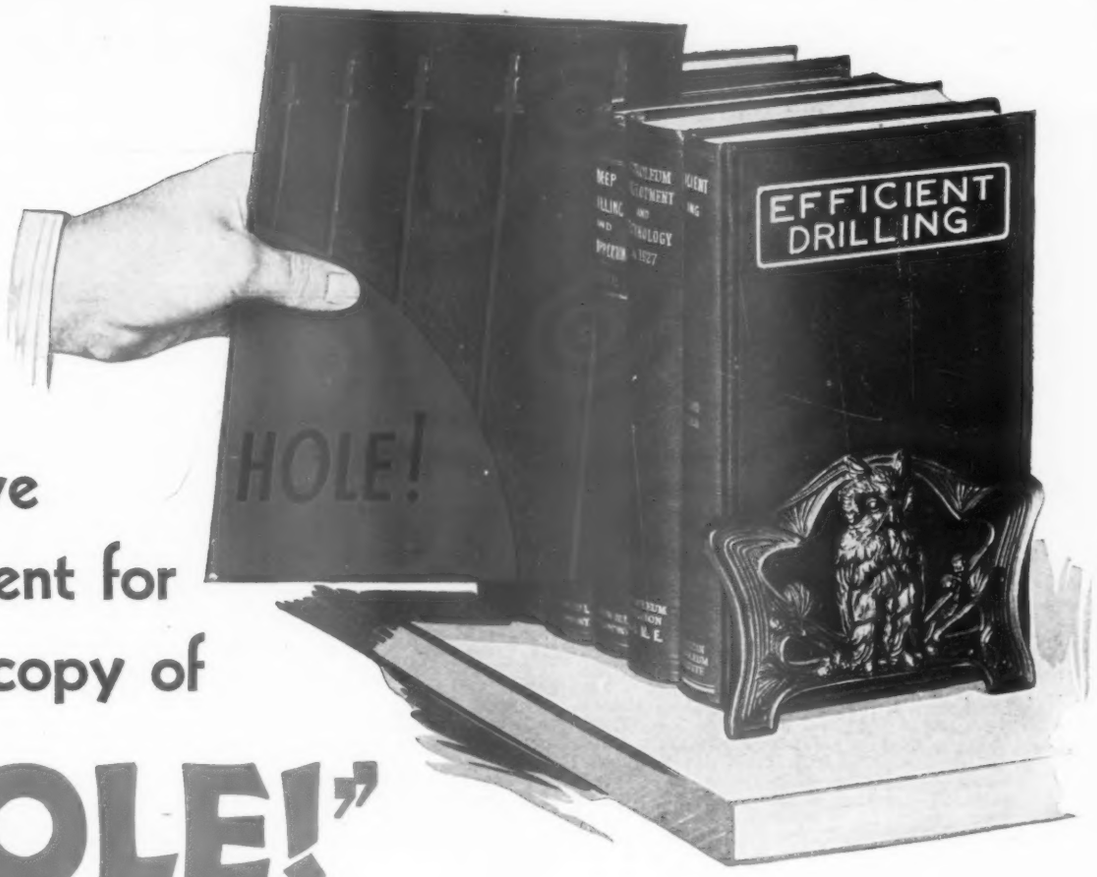
ANDERSON COUNTY — Humble's W. Johnson 1, rotary rig, Jas Hall sur. Magnolia's Ed. F. Williams 2, Wm. Bledsoe sur, dr 1755 ft. W. H. Roeser, Inc., & Roeser-Pendleton, Inc.'s W. L. Moody 1, Jas. Welch sur, elev 349 ft, top Pecan Gap chalk 2953 ft, dr 3720 ft. Sun Oil Co.'s Bowers-Maier 1, E. G. Meyers sur, rotary rig.

DELTA COUNTY—Gaither Pet. Co.'s Smith 1, J. B. Anderson sur, sd 1310 ft.

ELLIS COUNTY—G. C. Foster & S. C. Richardson's Moise-Cerf 1, spudded and sd.

FREESTONE COUNTY — Haley-Young et al's Knight 1, David Bullock sur, sd 4718 ft. O. W. Killam-Phillips et al's R. M. Edwards 1, A. Sanchez sur, rotary rig. C. F. Lytle et al's Holt 1, dr 3250 ft. Penn Oil Co. et al's B. M. Burgher 1, C. Chamar sur, materials.

HENDERSON COUNTY—E. L. Chapman



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et al's Cade 1, Simon Weiss sur, co 1800 ft. Cranfill-Reynolds & La. Oil Ref. Corp.'s Broome 1, Samuel Chairs sur, lcn.

LAMAR COUNTY—B. L. Laubenheim et al's S. D. Johnson 1, Wm. Driggers sur, elev 667 ft, top chalk 1310 ft, fsh drill stem 3090 ft.

LEE COUNTY—D. H. Byrd et al's R. L. Bostic 1, dr 3673 ft.

LIMESTONE COUNTY—Frank Maley & Arthur Heeman's D. Wilkes 1, John Breeding sur, sd 690 ft.

RUSK COUNTY—Magnolia's Duran-Wylie 1, Aquilla Norris sur, rotary rig, dr 400 ft.

SMITH COUNTY—R. H. Davis et al's J. H. Starnes 1, J. W. Allen sur, sd 970 ft. Deep Rock Oil Co. et al's Bowdoin-Fleming 1, M. V. Lout sur, elev 434 ft, sd 1450 ft. East Texas Pet. Corp.'s Kadane 1, John McFadden sur, elev 465 ft. O. M. Rector et al's M. Dozier 1, Mathew Maise sur, lcn.

TITUS COUNTY — Wainwright-West Oils, Ltd. (W. L. Murrell & Geo. M. Anderson's) Walcott & Lott 1, D. M. Smith sur, rig.

UPSHUR COUNTY—E. L. Chapman et al's J. H. Hudspeth 1, J. C. Dearman sur, dr chalk 3959 ft.

VAN ZANDT COUNTY—Central Oil Co. & H. L. Hunt's S. J. West 1, A. C. Walters sur, elev 564 ft, dr in shale 2720 ft. Warren Daniels et al's Fannie Cumby 1, John Wright sur, lcn. Dennis Oil Co. (H. Harper et al's) C. W. Morris 1, C. L. Morrison sur, spudded and sd. W. H. Kerbow et al's J. A. Everitt 1, A. Carlisle sur, elev 410 ft, dr 2370 ft. Manley-Aprinkle & Evans' B. C. Andrews 1, Margaret Neal sur, rotary rig. R. C. McElmurray et al's J. W. Peel 1, S. T. Meeks sur, sd 1110 ft. Arthur H. Ray & Ward Powell's A. J. Berry 1, Nacogdoches County sur, spd and sd. T. G. Shaw-Fagg et al's W. F. Huddle 1, L. Richardson sur, elev 545 ft, top Pecan Gap chalk 2593 ft, sd 3005 ft. Texas Chief Oil & Royalty Co.'s J. P. Foster 1, Montgomery sur, lcn. Van Zandt Oil & Dev. Co.'s Sharp-Robinson 1, J. B. Ybarba sur, dr 1410 ft.

VAN ZANDT COUNTY (Van Field)—Central Oil Co.'s R. H. Peters 1, Nacogdoches County sur, rotary dk. Hart Oil Co.'s O. L. Swain 1, (2.3 acre tract) John Walling sur, lcn. Pure Oil Co.'s R. C. Crim 1, elev 483 ft, top Pecan Gap chalk 1745 ft, dr 1910 ft. Sun Oil Co.'s I. W. Thompson 1, elev 505 ft, top Austin chalk 2138 ft, cem cas on sand 2461 ft, td 2491 ft. The Texas Co.'s W. White 1, dr sandy shale 2470 ft.

WOOD COUNTY—Gulf Prod. Co.'s N. E. Carver 1, Wm. Kern sur, spudding. Westexas Oil & Royalty Corp.'s Negro Orphanage 1, Chas. E. Rivers sur, rotary rig.

Lincoln County

Tulsa.—Two wells were completed durnig the past week in the Chandler field, Lincoln County, Oklahoma. Magnolia Petroleum Company's Freeman 1, SW SE SE Section 8-14-4e, had the Simpson sand from 4992-5003 feet. It was plugged back to 5001 feet and swabbed 135 barrels of oil. The same company's Staubus 2, NE SW SE Section 8-14-4e, swabbed 240 barrels from the Simpson sand at 5005-36 feet.

EAST TEXAS

BOWIE COUNTY—Hooks O&G Co.'s Rosenberg 1, King sur, ta 3086 ft.

CAMP COUNTY—Rogers et al's Enfelt 1, Montgomery sur, sd 1920 ft.

MORRIS COUNTY—Tucker & Fullwood's Henderson 1, J. C. Riddle sur, dk pat.

RED RIVER COUNTY—D. M. Duffington's Hoosier 1, Hughart sur, sd 1863 ft. Shad Harper's Garland 1, Wagley sur, sd 1440 ft. Johnson Pet. Co.'s Randolph 2, Dean sur, sd 1862 ft.

SHELBY COUNTY—Chapparral Oil Co.'s Holt 2, Matthew Moore sur, co 3004 ft. Benedum & Trees' McCann 1, Nancy Beattie sur, dr 2045 ft.

TITUS COUNTY—Canadian Oil Co.'s Walcott 1, D. N. Smith sur, dk.

SOUTHWEST TEXAS

BASTROP COUNTY — Gulf's Spillman 1, lcn. Harper et al's Mitchell 1, dk. Humble's Singer 1, lcn; White 1-A, lcn. Johnson Bros.' Cox 1, sd 2000 ft. Superior Oil Co.'s King 1-A, dr; Lasher 1, dk.

BEXAR COUNTY — Burton Oil Corp.'s Shook 1, prep to sp in. Ecker's Sandemeyer 1, dr. Leon Creek Oil Co.'s Reininger 1, dr. Dingham-Schimmil's Kelso 1, showing in Edwards at 1480 ft. Moore & Juar's Ellison 1, dr about 2040 ft. Penn-Tex Oil Co.'s Dobrowlski 1, dr. Wallace et al's Dullnig 1, sd at 1350 ft.

BEE COUNTY—Houston Oil Co.'s McKinney 1, prod 500 bbls at 3971 ft. Nichols et al's Hicks-Hahl 1, lcn; Hicks-Hahl 2, lcn. Mauldine Bros.' Kilden 1, prep to sp in. E. S. Price's Weiss 1, lcn. Texas Co.'s Tips 3, sd 100 ft. Union Prod. Co.'s Ray 6, dr 4200 ft, show at 4143 ft; Ray 5, sp in.

BROOKS COUNTY — Houston Oil Co.'s Holbein-Wormser 1, prod 200 bbls and 10 mil cu ft gas at 4145 ft. Humble's Singer 1, dr 2114 ft.

CALDWELL COUNTY—Calico Pet. Co. et al's Martin 1, being completed 2929 ft. Buchanan et al's Cude 1, ru. Stone et al's Croyne 1, dr; Quinn 2, sd 2300 ft. Harper et al's Thomas 3, fsh; Crenshaw 1, reaming at 1950 ft. Humble's Tiller 5-A, dr; New 1, dr 2736 ft. Malcolm & Keene's McNeill 1, sd 900 ft. McIntyre's Towns 1, sd 2630 ft.

DE WITT COUNTY — McIntyre's Von Roeder 1, sd 1480 ft. Rose et al's Linhardt 1, sd 1750 ft. Zoch et al's Steinman 1, dr 3590 ft.

DIMMITT COUNTY—Texas Gas & Fuel Co.'s Laxon 1, sd 680 ft.

DUVAL COUNTY—Allied Gas Co.'s Bruni 1, prod 30 mil cu ft gas at 2269 ft; Dinn 8, lcn; Peters 1, prod 30 mil cu ft gas at 1759 ft. Buckner et al's Peters 1, dr; Bruni 1, dr. Humble's Koehler 41, lcn; Koehler 42, prep to set cas. O. W. Killam's Bruni 17, dr. Long's Hahl 4, prod 40 bbls at 2312 ft; Hahl 3, lcn. Magnolia's Brennan-Benavides 4, dr; King-Harper 2, lcn; Benavides 6, dr 400 ft. National Oil Co.'s Ball 2, dr. Simms Oil Co.'s Dinn 8, coring 1700 ft. Southern Oil Co.'s Welder-Woods 1, sd 750 ft. Everett Suladie's Peters 1, dr. Trapshooter Reilly C. W. Long's Hahl 4, dr. Zoch et al's King 1, dr 2300 ft.

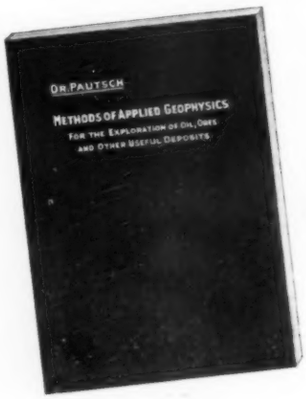
FALLS COUNTY—O. W. Killam's C. A. Jones 1, dr.

FAYETTE COUNTY—Smith Bros.' 1, dr.

GOLIAD COUNTY—Compton & Co.'s A. T. Framme 1, sd. Morgan Oil Co.'s Ray 1, sp in.

GONZALES COUNTY — Adams & Lisles' Jackson 1, dr 1590 ft. Acme Oil & Royalty Co.'s Weber 1, dr 1600 ft. Beeman & Station's Station 1, dr. Joe Bruner's Miller 1, sd 3490 ft. Burt & Son's Menking 1, dr. Finnel & Elam's Robinson 1, sd. Fitzsimmons et al's Huber 1, dr 1300 ft. Keiffer's Dix 1, dr 2900 ft. Grayburg Oil Co.'s Willow Springs 1, dr. Green et al's Dix 1, sd. Lindermann Bros.' Frampton 2, dr. United North and South Oil Co.'s Kerr 1, dr 5576 ft.

GUADALUPE COUNTY—Cranfill-Reynolds' R. C. Appling 1, coring 2700 ft. Clemens-Trinity Drlg. Co.'s Miller 1-B, prod 500 bbls at 2621 ft; Miller 2-C, sp in. Empire's Wilson 2, prod 800 bbls at 2533 ft; Dowdy's Wilson 3, prod 400 bbls 2598 ft. Grayburg Oil Co.'s Wells 2, lcn. Gulf's McKean-Dix 2, waiting on cement at 2620 ft. Baker Posey 1, waiting on cement at 2615 ft; Baker-Posey 2, waiting on cement at 2610 ft; Baker-Posey 3, waiting on cement at 2620 ft. Gulf Ref. Co.'s McKean-Dix 3, prep to sp in; McKean-Dix 4, dr 2350 ft; Knoblock 1, dr below 2000 ft. Humble's Yates-Wilson 1, dk; Yates-Wilson 3, lcn; Denman 4-A, prod 1250 bbls at 2579 ft; Denman 6-A, being completed at 2616 ft; Denman 1-B, dr; Dowdy 1-A, prod 425 bbls at 2610 ft; Dowdy 2, lcn; Baker 1, lcn; Baker 2, lcn; Sally Wilson 1, sp in; Thomas Dix 5, bailing around 2600 ft; Denman 7-A, prod 1000 bbls at 2593 ft; Denman 8-A, dr 2360 ft; Denman 6-A, dr 2450 ft; Mrs. Tadlock 1, dr 2580 ft; Denman 10-A, lcn. Magnolia's Echols 1, being completed at 2540 ft; Echols 2, dr 2420 ft; Rand Miller 2, dr 2550 ft; Echols 3, dr 2330 ft; Roamel 1, dr 2770 ft; Roamel 2, dk; Roamel 3, dk; Walker 1, prep to sp in; Dix 4, waiting on cement at 2610 ft; Goldman 1, testing at 2720 ft; Dix 6, sp in; Knobel 2, prep to sp in. Stroube & Stroube's Rand Miller 1, prod 500



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Following completion of a 60,000,000 foot gas well by the Constantin Oil & Refining Company, on April 22, 1920, in Section 12-18s-16w, Union County, at a depth of about 2400 feet, other wells were started.

F. C. PETERS, *Manager El Dorado Store*

The Eldorado District came into great prominence when the S. T. Busey et al's Armstrong 1, NWc Section 31-17s-15w near El Dorado, blew in from depth of 2150 feet, with an estimated production of from 4000 to 5000 barrels, but when it was finally brought under control it made about 1000 barrels. Up to the end of the year 1929 this field had produced slightly under 44,000,000 barrels of oil.

In the early part of March, 1926, the Lisbon pool was discovered when Wingfield et al's Slaughter 1, Section 9-17-16w, Union County, made 400 barrels of oils from sand found at 2075 feet. Peak production occurred during the week ending March 22, 1926, when this pool produced 11,750 barrels. Total production up to January 1, 1930, was 4,750,000 barrels.

The Champagnolle field, Union County, was opened on June 24, 1927, by the Ohio Oil Company's Crain 1, Section 1-17-14. It made 50 barrels on the pump at 3014 feet. During 1928 this field produced 3,688,000 barrels and in the first six months of 1929, the production totalled 1,677,450 barrels.

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bbls at 2680 ft; Rand Miller 2, lcn; Rand Miller 3, lcn; Rand Miller 4, lcn. Sun Oil Co.'s Knoblock 1, prod 250 bbls at 2585 ft; Knoblock 2, prod 800 bbls at 2540 ft; Knoblock 3, sp in; Knoblock 4, ru. Texas Co.'s Roamel 1, dr; Roamel 3, dr 2100 ft; Dowdy 1, prod 75 bbls at 2650 ft; M. Roamel 1, dr 2580 ft; Lemmy Anderson 2, sd; Lemmy Anderson 3, dk; Lemmy Anderson 4, prod 300 bbls at 2670 ft; Dallas-Wilson 2, dr; Dallas-Wilson 3, dk; Dallas-Wilson 5, dr 2300 ft; Henry Willie 3, dr 2601 ft; Parish 1, prod 850 bbls at 2644 ft; Knoblock 1-A, dr; Knoblock 1-B, ru; Knoblock 2-B, ru; Knoblock 3-B, dr 2110 ft; Posey Baker 2, dk. Thurman et al's Talley 1, dk; Dowdy 2, sd at 1200 ft. United North and South Dev. Co.'s Roamel 3, dr.

JIM HOGG COUNTY—Alworth, Stevens & Hild's Garza 1, dr. Deep Rock Oil Co.'s Kelsey 1, abn. L. M. Holden's Jones 4, dr. O. W. Killam's Martinez 2, dr. Magnolia's Martinez 4, dr; Martinez 5, dr; Weil 1, dr 2890 ft. Marshall-George's Holbein 4, dr; Holbein 5, dr. Moore-Milam Dr. Co.'s Guerra 1, dr. Randado Oil Co.'s Palacios 35, abn 100 ft. Texas Co.'s Bandera 1, dk.

KARNES COUNTY—Texas Co.'s Butler 1, (Medio Ranch), dr; Burnett 1, dr.

KERR COUNTY—Machs et al's Love 1, sp in.

KENDALL COUNTY—Berget et al's Willie Haag 1, reaming below 600 ft to set cas. Dixon 1, dr. Sterling et al's Wormser 1, no report.

LA SALLE COUNTY—Southwestern Pet. Corp.'s Beckwith 1, dr. Sun Oil Co.'s Berry 1, dr. Salt Lake City Oil Co.'s Beckwith 1, dr 2360 ft.

LIVE OAK COUNTY—Catlett & O'Neill's Smith 1, dr 3580 ft. Houston Oil Co.'s Dunning 2, dr 4300 ft. Rowan Oil Co.'s Croquet 1, dr; Lynn 1, lcn. Simmons Oil Co.'s Croquet 1, dr 2440 ft.

MAVERICK COUNTY—Rycade Oil Corp.'s Chittim 3, dr 6585 ft; Chittim 4, pulling cas at 6130 ft; Chittim 5, sd 3442 ft; Chittim 6, lcn; Sullivan 5, lcn.

MEDINA COUNTY—Donaldson Oil Co.'s Adams 2, prep to sp in. Calico Pet. Co.'s Crawford 1, dr. Pan-American Oil Co.'s Harrison 1, dr. Pearson Oil Co.'s Irrigated farms 1, dr 450 ft. Switzer et al's Zerr 1, dr 5720 ft. Pure Oil Co.'s Fohn 1, dr.

McMULLEN COUNTY—Hilton, Phillips et al's Durden 1, lcn. Southern Crude Oil Co.'s T. D. Baker 1, sd.

NUECES COUNTY — Graham, Wallace, Yeakery & Patton's Wallace 1, sd at 2640 ft. Saxet Oil Co.'s Dinn 5, set cas at 3680 ft.

REFUGIO COUNTY—Heap's Rutherford 1, prod 2200 bbls at 3674 ft. Edwin Jones' Lessering 1, lcn. Houston Oil Co.'s Rooke Hotel 1, dr 900 ft; Rooke 1, Blk 48, ru; Carlisle 1, ru; Bumgarten 1, dk; Ward 1, lcn; Tom Heard 1, sp in; Ray 2, set cas at 3673 ft. Houston Gulf Gas Co.'s Lambert 1, prep to set cas 5660 ft; Lambert 2, prep to sp in; Rose Lambert 1-A, dr 810 ft; Morgan Vance 2, being completed 3685 ft; Plummer 3, dr 2800 ft; Morgan-Shelly 3, lcn; O'Brien 6, dr 3440 ft; T. P. Shelly 9, dr 3100 ft. Independent O. & G. Co.'s West 2, prod 700 bbls at 3677 ft; JBF Heard 1-B, working over 3660 ft; JBF Heard 2B, wo, some oil and gas pressure at 3670 ft; Shelly 1, dr; Huddleton 1, lcn; Mercy Academy 1, ru; Helen Reilly 1, lcn. Jones et al's Lessering 1, dr 640 ft; Heard 1-A, lcn; Mitchell 1-A, lcn. Larco Oil Co.'s Strauch 2, dr at 560 ft. Morgan Oil Co.'s Fox 1, prod 1300 bbls at 3685 ft; City 4, prod 750 bbls at 3660 ft; No. 1, Blk 2, set surface cas at 1200 ft; No. 1, Blk 32, dr 3232 ft; City 5, ru; Hornberg 1, dr 800 ft. Oigfuer Oil Corp.'s Ryals 3, dr. Pearson Properties' Ryal 1, dk. Price et al's Mission 1, dr 1200 ft. Refugio Oil Corp.'s Wheeler Hrs. 1, Blk 50, set cas at 3670 ft. Sun Oil Co.'s Buckley 3, Blk 2, ru. Texas Co.'s Shelton 1, dr 3500 ft; Holmes Heard 3, dr Saxet Oil Co.'s Cable 1, Blk 19, dr; Cable 1, Blk 20, dr 3120 ft; Fox 1, Blk 95, lcn; Powers 1, Blk 3, lcn; Serafino 1, Blk 5, lcn. Rutherford Oil Co.'s No. 1, Blk 92, flowing 900 bbls at 3677 ft; No. 1, Blk 77, being completed at 3676 ft. Union Prod. Co.'s O'Brien 2, showing at 5580 ft; Shelton 1, set cas at 5407 ft;

SAN PATRICIO COUNTY — Laferria Oil & Gas Co.'s Smith 1, set cas at 2246 ft.

STARR COUNTY—W. M. French's Reilly Allen 5, dr 2066 ft. Smith Adams' C. B. Welch 1, dr 759 ft. Texas Co.'s Guerra 1-B, dr. Milam Dr. Co.'s Allen 5, dr.

VICTORIA COUNTY — Humble's Welder 3-A, prep to bail at 5900 ft.

VAL VERDE COUNTY — Blume et al's Yose 1, dr. Phantom Oil Co.'s Ingram 1, dr 2440 ft. Transcontinental Oil Co.'s Goode 1, dr.

UVALDE COUNTY — Phantom Oil Co.'s Claudt 1, prep to sp in. Weldon & Welch's Benson 1, dr 750 ft; Edmonds 1, dr 600 ft.

WEBB COUNTY—E. H. Buckner's Rose Benavides 1-A, ru. Foster Barnsley's Webster 7, set cas. Houston Oil Co.'s Benavides 2-C, lcn; Benavides 2-D, dr. J. J. O'Brien's Benavides 3, sp in; M. Benavides 1, dr; Perez 1, dr. O. W. Killam's 17, dr 2320 ft. Magnolia's S. Perez 1, dr 5100 ft. W. E. May's 1, Sec. 694, ru. W. R. Shankle's Webster 1, dr.

WILSON COUNTY—Rycade Oil Co.'s Hice 1, coring at 3250 ft. Tidal Oil Co.'s Kulezsa 1, dr 3720 ft. Trinity Drillers-Arkansas Fuel Oil Co.'s Richter 1, flowed sulphur water at 4460 ft.

ZAPATA COUNTY—Allied Gas Co.'s 1, dr. Blair & Son and Claggett's Trevino 2, prod 150 bbls at 1240 ft. Duval Oil Co.'s 1, dr. Blankenship et al's Garza 2, moving in tools prep to sp in. O. W. Killam's Cuellar 19, prod 500 bbls at 1537 ft; Martines 2, dr; Cuellar 20, moving in tools.

ZAVALLA COUNTY—Baldwin Co. et al's Price 1, sd. Southern Crude & Oil Co.'s Washer 1, set surf cas. Weigand et al's Gates 1, repairing machinery, hole 1000 ft. Texas Gas Fuel Co.'s West 4, dr 1150 ft; Matthews 1, dr. Tritex Oil Co.'s Burns 1, sd 780 ft; Childress 2, dr 700 ft.

TEXAS GULF COAST

AUSTIN COUNTY—J. T. O'Hara's Batla 1, 2 mi nw Raccoon City, dr 3077 ft shale.

BRAZORIA COUNTY—Thos. Faust et al's Fee 6, 2 mi s Nash Dome, dr 3500 ft sandy shale. Shell's Blakely-Winston 1, Danbury, below 3900 ft. Mills Bennett's Allen 1, Allen Dome, dr 4928 ft sandy shale, oil show. Rucks et al's Hunter 1, sw Hoskins Mound, dr 350 ft. Ward Drilling Co.'s Proctor 1, Hoskins Mound, dr 500 ft shale.

CHAMBERS COUNTY—Pure's Mayes 4, Lost Lake, abn 2818 ft; Mayes 6-A, abn at 3290 ft cap rock; Mayes 9, dr 2673 ft shale; Mayes 10, lcn; Lost Lake 4, dr 100 ft. Shell's Herff 1, Moss Bluff, lcn.

FORT BEND COUNTY — Gulf's Brazos Valley Irrig. Co. 1, 3 mi sw Clodine, dr 3000 ft gbo; Moore 20, Moores Field, dr 2850 ft sand.

HARRIS COUNTY—Humble's Simms-Smith 77, Goose Creek, dr 3925 ft; Warren 7, Hockley, dr 3150 ft sand and shale; Woodburn 2, 2 mi s Genoa, dr 4739 ft shale; Minnetex 2, Mykawa, sd 1177 ft; Siadous 1, Mykawa, dr 4876 ft shale and sand. Watts Drlg. Co.'s Hubert 1, Mykawa, tested salt water at 4725 ft, will probably dr deeper. Higgins O&F Co.'s Siadous 1, dr 5050 ft sandy shale. West et al's Scorrega 1, Goose Creek, abn at 5080 ft. Cranfill-Reynolds Co.'s Brown 1, 5 mi nw Goose Creek, dr 5575 ft sand. Mrs. J. C. Baldwin's Kitzman 1, 2 mi n Cypress, sd 4055 ft. Martin et al's Haney 1, e Elena, ru. Buffalo Oil Co.'s Beall 1, 2 mi nw Eureka, dr below 3500 ft.

JEFFERSON COUNTY—Gulf's Bordages 8, Fannett, dr 5140 ft shale; G. W. Junker 1-A, dr 5025 ft sandy shale; E. Thomas 1-A, dr 1485 ft gbo; E. Thomas 13, ru. The Texas Co.-Houston Oil Co.'s Fitzhugh 1, Big Hill, dr 5713 ft shale. The Texas Co.'s Pipkin 2, Big Hill, sd 6008 ft. Stilwell Oil Co.'s Brinkman 1, dr sandy shale at 3150 ft.

LIBERTY COUNTY — Harrison Oil Co.'s Jamison 1, N. Dayton, dr 3950 ft lime rock. The Texas Co.'s and Paraffine Oil Co.'s Fee 1, N. Dayton, ru. Harvey Smith's Brown and Tadlock 1, N. Dayton, ru. Gulf's Weiser 1, Hankamer, dr 5675 ft shale; Boyt 3, dr sandy shale at 4450 ft. Cranfill-Reynolds Co.'s Esperson 4-A, Esperson Dome, dr 3180 ft gbo; Esperson 6, dr 2135 ft shale; Esperson 7, lcn; Davis 2, spudded. Yount-Lee Oil Co.'s Moores Bluff Corp. 2, Esperson Dome, dr 6150 ft shale.

MATAGORDA COUNTY — Cockburn et al's Hawkins 1, Shepherds Mott, dr 3125 ft shale.

ORANGE COUNTY — Veteran Oil Co.'s Read 1, 2 mi se Orange field, dr 4500 ft sandy shale. The Texas Co.s' Polk 2, Port Neches, dr 3067 ft sticky shale. Gulf's H. J. Stark 1, Port Neches, dr 5991 ft sandy shale.

WALLER COUNTY—Kirby Pet. Co.'s Jim Davis 1, San Felipe, sd 200 ft. W. P. Morris' Chapman 1, 6 mi n Hempstead, sd 1860 ft.

WASHINGTON COUNTY—W. D. Anderson's Hughes 1, 3 mi n Chapel Hill, sd 2150 ft; Mueller 1, ne Burton, dk. L. O. Gleason's Nowak 1, near Brenham, dr 800 ft rock.

WHARTON COUNTY—Houston Gulf Gas Co.'s Fields 1, Boling, dr 4255 ft heaving shale.

SOUTH LOUISIANA

ACADIA PARISH — Yount-Lee Oil Co.'s Houssiere-Latrielle 8, Evangeline, dr 3550 ft sandy shale; C. O. & M. Co. 5, abn 4560 ft cap rock; No. 6, dk; Simms Fee 1, dr 7200 ft. The Texas Co.'s Rayne Heirs 5, Evangeline, dr 6550 ft sandy shale.

ASCENSION PARISH — Gulf's United Lands Co. 17, Sorrento, dr 3200 ft sand. Triumph Oil Corp.'s Lacey 2, 3 miles se Sorrento, sd 4070 ft.

ASSUMPTION PARISH — Gulf's Armalise Planting Co. 1, Napoleonville, dr 3630 ft gbo.

CALCASIEU PARISH — Wilfred Lahay's James 2, 3½ mi s Starks dome, sd 3775 ft. J. O. Davis' Ind. Lbr. Co. 1, Starks, dr 3775 ft lime rock. Texas Gulf Sulphur Co.'s Lutcher-Moore 9, Starks, abn 1575 ft cap rock; No. 10, ru; No. 11, ru; Ind. Lbr. Co. 1, dr 1400 ft gbo.

CAMERON PARISH—The Texas Co.'s Calcasieu Lake 5-A, driving piling; State 6, E. Hackberry, moving in. Pure's Yount-Lee 7, Sweet Lake, sd 6381 ft; Yount-Lee 8, dr 4875 ft sandy shale; Yount-Lee 9, fsh 3215 ft. Shell's A. Marceaux 1, Mallard Bay, dr 7200 ft shale; Watkins 12, Black Bayou, wo, came in flowing 700 bbls 24 gravity net oil daily at 5240 ft. Vacuum Oil Co.'s Cameron Meadows 1, e Johnson Bayou, moving in rig.

IBERIA PARISH—The Texas Co.'s Vermilion Bay 4-A, dr 5880 ft sand. Jefferson Lake Oil Co.'s Lake Peigneur 4, Jefferson Island, set surface cas.

IBERVILLE PARISH—Shell's Wilbert 4, White Castle, dr 500 ft. Standard's Schwing 3, Bayou Blue, dr 2132 ft; Schwing 5, capped piling; Wilbert 3, preparing to set screen to test oil sand at 1975 ft; Wilbert 5, dk foundation; Wilbert 6 piling capped. Standard's Cyrus Case 1, Bayou des Glaise, set surface cas.

JEFFERSON DAVIS PARISH — Yount-Lee Oil Co.'s Geo. Courtney 1, Welsh, ru and sd. Pure's Day 1, 1½ mi sw Welsh, dr 2035 ft shale.

LA FOURCHE PARISH—Gulf's City of New Orleans 1, Marchand, dr 4050 ft sandy shale. Gulf's W. H. Stark 25, Thibodaux, dr 3300 ft.

PLAQUEMINES PARISH — The Texas Co.'s Garden Island Bay 3, depth 2000 ft. Humble's Cockrell-Moran 1, T. 20s-R. 26e, sd 1535 ft; Lake Washington 1, T. 20s-R. 26e, set cas at 3775 ft.

ST. LANDRY PARISH — Elbof Explorations' Valmont Ledoux 1, Eunice, sd 4365 ft. The Texas Co.'s Botany Bay Fee 4, Port Barre, dr 3380 ft sandy shale. Gulf's Ovide Lahaye 1, Port Barre, dr 3150 ft gbo; Gaudet 2, Port Barre, lcn. Hebert-Baker Oil Co.'s Fisher 1, Sec. 10-3s-4e, sd 3600 ft.

ST. MARTIN PARISH—The Texas Co.'s St. Martin Ld. Co. Fee 1, Hager dome, dr 6100 ft; No. 2, dr 4842 ft shale; Iberville Ld. Co. 1, Hager Dome, depth 5285 ft. Yount-Lee Oil Co.'s Hebert Heirs 1, Anse la Butte, dr 3875 ft shale. Rycade-Humble's Bayou Bouillon 9, dr 500 ft; Atchafalaya Fee 5, dr 2900 ft shale.

ST. MARY PARISH—Empire & Vacuum's Zenor 1, 2 mi n Patterson, dr 1250 ft. Pure's Wax Lake State 1, wtg on materials.

ST. TAMMANY PARISH—Washington & Tammany Drlg. Co.'s A. Cousack 1, dr 2700 ft shale.

TERREBONNE PARISH — Chas. Paggi's Evergreen 2, sd 500 ft. The Texas Co.'s Caillou Island State 3, lcn; Four Isle Bayou 3, lcn; Lake Pelto B-2, dk; Lake Pelto 3-B, dr 4200 ft sand; Bayou St. Elaine 4, moving in; Lake Barre State 3, dr 1100 ft; Dog Lake Bayou 2-B, dr 5560 ft hard sand.

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ARAPAHOE — McDeb Drilling Co.'s Fitzsimmons 1, se 7-4s-66w, fsg at 5090 ft.

ARCHULETA — Standard of Colo. Inc., Fitzhugh 1, sw 34-33n-1e, ready to spud.

BENT—Continental, Pipe Springs 1, se 27-27-41, ur 5504 ft.

BOULDER—Reliance Oil Co.'s Erickson 1, nw 32-2n-70w, sd 345 ft.

DOLORES—Transcontinental, Glade 1, nw 30-41n-16w, sd 5805 ft.

DELTA—Crawford O & G Co.'s McKissen 1, ne 28-15-91, preparing to resume at 970 ft.

ELBERT—Belmont Oil Co.'s Maher 1, sw 4-6s-59w, installing standard esuipment at 3720 ft.

FREMONT—Westerville Oil Co.'s State 1, nw 16-18-69, sd 1214 ft. Continental's Steinmier 4, se 35-18-70, dr 480 ft. Standard of Colorado's Tiger 1, nw 26-19s-89w, sd at 1655 ft. Hammond & Rosco's Beltrame 1, sw 1-19s-70, sd 1800 ft.

JACKSON—Midwest, Rich 21X, nw 9-6-80w, sd for winter at 3381 ft. P & R Hendershot 1, ne 2-6n-81w, sd for winter at 3610 ft.

JEFFERSON—Ruby Hill O & G Co.'s Branden 1, se 24-4s-69w, u rto 3578 ft.

HUERFANO — Parker Club and Kinney-Coastal Fee 1, se 4-28s-68w, set 5 3/16-in. casing at 3924 ft. Elliot et al's Abeyta 1, nw 31-27s-65w, location.

LAS ANIMAS—Trinidad Dev. Co.'s Flonts 1, sw 23-32-63, set 5 3/16-in pipe at 2700 ft. Helium Co.'s Hall 1, sw 19-27s-59w, abd 935 ft. Helium Co.'s Cowdrey 1, nw 35-29s-60w, location.

LARIMER—Mosher et al's Reed 1, nw 28-4n-69w, sd 3100 ft. Barrows et al's Barrows 1, sd 2310 ft. Continental's Scott 5, nw 6-19n-68w, dr 1200 ft. Deininger et al's Rembey 1, ne 35-4n-70w, resuming at 354 ft.

LA PLATA—Royal P & R, Red Mesa 1, ne 27-33n-12w, preparing to resume 360 ft. Detroit Oil Ass.'n Olbert 1, sw 9-35n-12w, fsg tools 1995 ft.

MESA—Argo Oil Co.'s Hoel 1, ne 23-8s-104w, ur to 2712 ft.

MOFFATT—McLaughlin et al's Williams 1, 2-3-92, sd 4385 ft. Vermillion O & G Synd, 1, se 23-9n-100w, sd 642 ft. Texas Production Co.'s Berli n1, ne 18-12-100w, sd for winter at 2347 ft. Midwest's Hanawalt 24, se 4-6n-92w dr in brown shale at 825 ft. F. McCormick's Sales 1-A, se 28-4n-92w, sd 3190 ft.

RIO BLANCO—Texas Production's Potter 1, se 30-2n-69w, re-running casing at 5665 ft. White Eagle's Fordson 1-A, sw 9-2s-96w, ur to bottom at 2905 ft.

ROUTT—Gillespie et al's Omholt 1, se 29-4n-79w, ready to spud. Ruby Hill O & G Co., nw 17-6n-86w, plugging back from 3127 to 2250 ft.

WASHINGTON—Middlemist Oil Co.'s Middlemist 1, se 14-4s-56w, sd 1030 ft.

WELD—Platte Valley Pet. Corp.'s Patterson 1, se 24-6n-61w, sd 4900 ft with gas showing.

YUMA—Phillips Pet.'s Andrews 1, nw 3-25-42w, dr 4988 ft. Major Pet. Co.'s Black Wolf 1A, 7-2s-43w, sd at 1535 ft.

MONTANA

BIG HORN — Montana Production Co.'s Lynde 2, se 21-6s-35e, sd 3056 ft.

CARBON—Atlantic Oil Co., 2, 20-7s-24e, sd in Madison 1840 ft.

CARTER—Carter & Co., 1, nw 11-2n-58e, plugging back to 2030 ft to test oil showing. Montesota Oil & Development Co., 1, se 7-8n-58w, setting 5 3/16-in casing at 930 ft. Poss Petroleum Corp., nw 7-8n-57w, sd for winter at 2505 ft.

CASCADE—Peiga net al., 36-20n-3w, dr at 1750 ft. Eden Oil Co., 1, sw 27-18n-4e, sd 1325 ft.

CUSTER—Montana Bell Oil Co., 1, ne 28-8n-45e, sd for winter 4652 ft.

DANIELS—Whitetail Oil Syndicate, 1, nw 10-36n-50e, sd 1467 ft.

FERGUS—Melton Corp., sw 24-21n-17e, dr at 2650 ft.

GALLATIN—California Co.'s Ringling 1, se 35-5n-7e, repairing rig at 3255 ft.

GARFIELD—Montana Corp., (Texas Pacific Coal & Oil Co.'s) State 1, ne 36-16n-38e, dr at 2255 ft.

GLACIER—Kootenai Oil & Gas Co., 1, 13-35n-6w, sd 250 ft. Cosmos Oil Co.'s Hannah 1, sw 22-36-12w, rig up. Rim Rock Oil Co.'s Brown 1, se 29-35n-5w, rig up.

LIBERTY COUNTY—Square Deal Oil Co.'s Federal Land Bank 1, 1-32n-7e, sd 3470 ft. Thompson's Thompson 1, sw 7-34n-4e, sd at 2214 ft. Northland Oil & Gas Co.'s Yurman 1, 35-33n-6e, sd 1030 ft.

MUSSELSHELL — Minnesota-Flatwillow, Ivanhoe Dome 1, 7-11-31, spudded in and shut down.

PETROLEUM—Minnesota-Flatwillow, 2, sw 5-12n-25e, dr at 1558 ft. Oregon-Flatwillow Oil Co., 1, 3-13n-26e, sd 200 ft.

PONDERA—Valier-Williams Oil Co.'s Anderson 1, ne 7-29n-4w, resumed at 3000 ft. Hiland-Van Daele's Kendall 1, ne 35-30n-3w; ur casing to 4215 ft. Miller Bros.'s Bruins 1, nw 17-28n-1w, rig up.

MONTANA

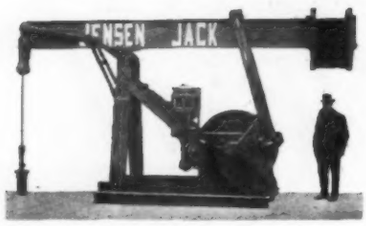
ROSEBUD—Prairie Oil & Gas Co.'s Northern Pacific 1, 9-10-39e, sd 2310 ft. Prairie, N. P. 3, 26-10n-39e, sd 2073 ft. Prairie, N. P. 4, 28-10n-38e, sd 65 ft.

SHERIDAN—Sheyenne Oil & Gas Co., 1, nw 15-36n-53e, sd at 1400 ft. waiting for 10-in casing.

SWEETGRASS—Shoshone Consolidated Oil Co.'s Northern Pacific 1, nw 23-2n-15e, sd at 5805 ft.

TETON—Andover Oil Co.'s Carlson 1, ne 5-25n-4w, sd 150 ft. L. B. O'Neill's State 1, nw 16-25n-5w, sd 2305 ft. Newman et al's Fitzgerald 1, se 26-32n-1w, rig up. Rocky Mountain Oil & Gas Co., (Continental Development Co.'s) Salmond 1, ne 4-23n-8w, sd 852 ft. Mitchner et al's Rondas 1, sw 9-23n-1w, sd 2170 ft with showing of oil. Earl Oil Corp., 1, ne 22-22n-82, sd 660 ft.

TOOLE—Monalta Oil Co.'s Buckley 1, se 1-37n-4w, dr at 2400 ft; Monalta Oil Co.'s Buckley 2, sw 1-37n-4w, rig. Anaconda Uetroleum Co.'s Barthelote 1, ne 19-36n-2w, sd 1635 ft. Mahan et al's Lee 1, 10-31n-1w, sd 2264 ft. Roxana Drilling Co.'s Toole 1, 22-36n-1e, sd 1700 ft. John Thomas et al's Buckley 1, ne 1-37n-4w, dr 150 ft. Black Gold Petroleum Co.'s Syrs 1, sw 30-36n-28e, rig completed.



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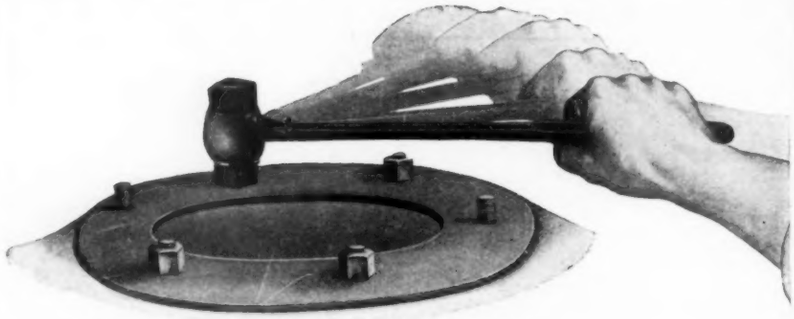

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BIG HORN—P & R Government 3, 24-65-98, sd 4183 ft. Westland Oil Inc., 24-54-95, sd crooked hole 360 ft. Wisconsin Holdings, 4-55-97, sd 665 ft. Yellowstone Pet. Co., 7-57-97, dr below 2400 ft.

CARBON—P & R, 2-19-88, sd 4562 ft. C. E. Bivens et al's Baggs 1, 35-13-92, sd 2200 ft.

FREMONT — Premier Oil Co., 7-28-93, sd 1221 ft.

HOT SPRINGS—Midwest, 8, 6-44-98, sd for 9-46-99, dr 3100 ft. Gebo Cons. 1, se 23-44-95, winter at 1052 ft. Ohio Oil Co.'s Smith 1, sd at 1245 ft. C. F. Robertson et al, se 17-43-92, sd 450 ft.

JOHNSON—United Oil Co., 7-47-82, sd 360 ft. R. C. Tarrant, 4-43-82, sd 600 ft. Dome Syndicate, 3, 4-43-82w, sd below 720 ft.

LINCOLN—Midwest Ref. Co.s Grey's River 1, 25-37-117, sd for winter at 1731 ft. Midwest, Waterfall 1, 35-22-115, sd 3510 ft. Mountain Oil Corp., 36-25-115, sd 100 ft.

PARK—P & R Pitchfork 1, 14-48-102, sd 1400 ft. Henderson Prod. Co., 31-58-99, sd 3000 ft. Ohio Oil Co.'s Burlington 1, 21-53-101, dr 4312 ft. Resolute Oil Co., 17-27-101, sd 4280 ft. Cody Pet. Corp.'s Danker 1, sw 22-57-98, sd at 2697 ft.

SWEETWATER — Mountain Fuel Supply Co.'s Tucker 1, 18-13-99, sd 2900 ft. Mountain Fuel Supply Co.'s Cappers 1, 2-9-104, sd 3200 ft. Mountain Fuel Supply Co., U. P. 1, 13-19-104, sd 3100 ft.

SUBLETTE—California Co., Union Pacific 1, sd 4600 ft.

UITNA—California Co., U. P. 1, 7-17n-119w, cleaning out to bottom at 4597 ft.

WESTON — Gose Syndicate, 28-47-65, sd 4004 ft.

UTAH

BOX ELDER—Utah-Pennsylvania Oil Co.'s Penrose 1, nw 3-10n-4w, dr 3385 ft. Lenora Mining & Milling Co.'s Swaboda 1, nw 9-8n-7w, sd 2755 ft.

CARBON—St. Thomas Oil Co., 1-14s-9e, fsg 2300 ft. Price River Pet. Co.'s Price 1, ne 16-14s-10e, preparing to resume at 3072 ft.

GARFIELD—Utah Oil Co.'s Butler Valley 1, dr 1900 ft.

GRAND—Crescent Oil Syn.'s McCarthy 1, sw 27-21s-19e, sd 1945 ft. Utah Southern Oil Co.'s State 1, se 26-21-33e, spudding. Cramer et al's Moss 1, sw 9-20s-23e, dr 2100 ft. Cisco Springs Syn.'s Cisco 1, sw 9-20s-23e, dr at 20900 ft.

KANE—Midwest Ref. Co.'s Parry 1, se 14-39s-1w, dr 1900 ft. Beaver Valley Oil Co.'s Black Rock 1, ne 20-25s-9w, fsg pipe at 3500 ft; Beaver Valley, Black Rock 2, se 19-25s-9w, sd 600 ft.

SAN JUAN—Boulder Knoll Oil Co.'s Boulder Knoll 1, nw 17-34s-25e, resumed at 2640 ft. Continental, Boundry Butte 1, se 22-43-22, set casing 5612 ft.

UINTAH—Home Oil Co.'s Spahr 1, sw 8-5s-21e, sd 1165 ft. Maud Ellen Oil Co.'s Neal 1, se 28-3s-21e, dr 1803 ft. Western Ventura Corp.'s Krumvieda 1, se 6-5s-21e, sd 1515 ft. Diamond Fork Oil Co.'s Diamond 4, nw 16-8s-5e, dr 1672 ft.

WASHINGTON—St. George Oil Co.'s Reynolds 1, nw 30-43s-14w, sd 970 ft. Mid-American Oil Co.'s Bloomington 1, nw 17-43s-15w, sd 1974 ft. Royal Oil Dev. Co.'s Grafton 1, se 34-41s-11w, sd 907 ft. Virgin Dome Oil Co's Harrisburg 1, nw 16-42s-14w, reaming 1380 ft. Arrowhead Petroleum Corp.'s Punchbowl 1, ne 1-43s-15w, sd 860 ft.

UTAH—Diamond Oil Co., 1, nw 16-8s-5e, sd 1700 ft.

IDAHO

BANNOCK — Norton Bros. et al's Marsh Valley 2, Lot 5 Sec. 19-10s-37e, sd 2600 ft.

CLARK—Monida Oil Co.'s Beaver Dome 1, nw 32-14n-36e, dr 900 ft.

POWER—Gem Ctate Pet. Co.'s Arbon Valley 1, nw 2-11s-33e, sd 3800 ft.

TETON—Grand Teton Oil Co.'s Horseshoe 1, se 33-5n-44e, ur to bottom at 1923 ft. Teton Valley Land & Leasing Co.'s Bevan 3, se 28-5n-44e, sd 1376 ft.

NEW MEXICO

CHAVES—Warman Oil Trust's Blackrome 1, ne 27-13s-24e, dr 1000 ft. Cactus Development Co.'s Sullivan 1, se 14-10s-26e, sd 2065 ft.

DE BACA—Matador Oil Co.'s Wood 1 sw

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6-4n-20e, udr 8¼-in at 2132 ft with total depth 2683 ft. Pittsburgh Oil Co.'s State 1, ne 16-1s-27e, sd 4506 ft.

EDDY—Danciger et al,'s Turner 2, sw 28-17s-31e, fsh 4445 ft, and showing much oil. Van Horn et al, se 18-19s-26e, dr 490 ft. Etz Bros, Etz 1, se 13-16s-30e, plugging back from 3840 ft. Levers & Carper's State 1, se 21- 17s-29e, plugging back from 3443 ft to 2285 ft for gas well. R. D. Compton's State 1, nw 2-20s-25e, sd 475 ft. Henderson et al's Arnold 1, se 23-17s-30e, dr 3100 ft. Welch et al's State 1, sw 27-17s-28e, sd 2500 ft. Flynn-Welch-Yates's State 57, se 19-19s-28e, dr 2400 ft; Flynn-Welch-Yates's Stephens 1, sw 13-17s-30e, ready to spud. Lockhort et al's Beeson 2, ne 28-17s-30e, dr 700 ft.

GUADALUPE—Los Angeles-Hollywood Synd.'s McMullen 1, sw 24-5n-16e, may change location.

LEA—Texas Production Co.'s State 2A, sw 2-21s-33e, completed at 3771 ft making 900 bbls. Texas, State 1B, Lot 5 Sec 1-21s-33e, water at 3750 ft. Empire Gas & Fuel Co.'s Glosson 1, se 22s-36e, sidetracking tools 3770 ft. Empire Gas & Fuel Co.'s State 3B, Sec 5-21s-35e, dr 4030 ft. Empire, Lindley 2, se 14-25s-36e, dr 695 ft. Continental's Sholes 2, nw 13-25s-36e, rigged. Continental's State 2, 1-21s-33e, dr 3355 ft. Continental's Myers 1, nw 28-22s-36e, sidetracking tools 3765 ft. Continental's State 1, nw 1-21s-33e, dr deeper from 3789 ft. Shell Pet. Corp.'s Thorpe 1, se 19-19s-38e, completed at 4170 ft as 1000 bbl well. Walker et al's Terry 2, se 10-19s-38e, spudded and sd. Humble O & R Co.'s Dindley 3A, sw 13-25s-36e, dr 400 ft. Humble's Koonce 1, ne 14-25s-36e, dr 1105 ft. Rector Oil Co.'s King 1, ne 26-25s-32e, dr at 4100 ft. Magnolia Pet. Co.'s Lindley 1-X, ne 26-25s-36e, dr 3030 ft. Bordages et al's Hughes 1, 27-19s-38e, sd 4012 ft. Morton et al's State 1, nw 32-11s-38e, dr 3455. Barnsdall Corp., 1, se 28-16s-38e, dr 4462 ft. Cranfills & Reynolds's State 1C, sw 16-23s-36e, dr 950 ft. Midwest's Terry 13, se 10-19s-38w, completed at 4120 ft with initial production of 825 bbls. Midwest's Wright 6, sw 14-19s-38e, dr at 4383 ft. Amerada Pet. Corp.'s State 1, ne 1-21s-33e, abd at 3960 ft. Snowden & McSweeney's State 1, sw 1-21-33, completed at 3800 ft making 200 bbls. Fisher & Lowrie's State 1, nw 11-18s-36e, standardizing at 2100 ft. Texas Pacific Coal & Oil Co.'s State 2, ne 21-23s-36e, deepened to 3757 ft and producing 600 bbls. Texas Pacific's State 3, nw 21-23s-36e, dr 2275 ft. Penn Oil Co.'s State 1, ne 21-19s-36e, dr 4965 ft. Walker et al's Terry 2, se 10-19s-38e, spd and sd. Cranfills & Reynolds' State 1-D, Lot 6 Sec 3-21s-33e, drg 415 ft. Harrison et al's State 1, sw 35-18s-38e, sd 565 ft.

McKINLEY—J. W. Halsell's Santa Fe 1, 17-18s-9w, sd 3085 ft. San Juan Coal & Oil Co., 1 se 21-18n-9w, sd 2205 ft. Williams et al's Santa Fe 1, sw 19-18n-8w, wtg casing at 1900 ft.

RIO ARRIBA—Berringer et al's Hartman 1, ne 8-29n-7w, preparing to resume at 825 ft. San Juan Pet. Co.'s Government 1, sw 14-30n-7w, sd 270 ft.

SAN JUAN — Dorothy Oil Co.'s Terwilligan 2, 29-30-9w, sd 1170 ft. Southern Union Gas Co.'s Day 1, sw 20-28n-10w, dr 1450 ft. Blackrock Oil Co.'s Blackrock 1, se 11-25n-13w, wtg on extension permit with td 1550 ft. Greathouse et al's Roderick 1, se 11-22s-14w, sd 1000 ft. Childers Dr. & Pr. Co.'s Westwater 2, nw 24-31n-16w, sd 2525 ft. Reserve Oil Co.'s Shaffer 2, ne 1-21n-14w, ur to 780 ft. Southern Union Gas Co.'s Garland 1, ne 11-28n-11w, sd 3100 ft. H. L. Williams' Bowman 1, ne 30-30n-15w, dr 2460 ft.

SAN MIGUEL — Pioneer O & G Co.'s Thunderbird 1, nw 14-15n-16e, sd 2251 ft. Starr Oil Co.'s Adams 1, ne 25-17n-17e, sd 3300 ft. Cibola Pet. Co.'s Crow 1, se 9-13n-14e, ur to 320 ft. Hershfield Dev. Co.'s Cabra Springs 1, ne 21-12n-22e, dr 947 ft. Benedict et al's Wilson 2, nw 25-17n-16e, ready to spud.

SOCORRO—Lockhart & Co.'s Stackhouse 1, 14-3s-6e, fsg 1910 ft.

TORRANCE—Williams et al's Etaplin 1, ne 16-8n-10e, dr 1665 ft.

VALENCIA—Rio Puerco Oil Co.'s N. M.-Ariz. Land Co.'s 2, ne 13-6n-2w, wtg for pipe 3145 ft. Acme Oil Co. N. M.-Ariz Land Co.'s 1, 26-6-3, dr 4716 ft. Harlan et al's Harlan 1, 5-6n-2e, dr 3415 ft.

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NORTH LOUISIANA
Completions

Company, Well and Location	Initial Production Bbls.	Depth
RED RIVER PARISH—		
Eylers O&G Co., Johnson 1, 17-12-10	3½	2752
RICHLAND PARISH—		
Triangle Drilling Co. & Woodley Pet. Co., Cumpton 1, 16-17-7e	*	2889
Woodley Pet. Co., Buie 1, 32-18-7e..	*	3280

BOSSIER PARISH—La. O. R. Corp.'s Matlock 1, 26-23-12, rig up. Natural Gas Prod. Co.'s U. S. 1, 31-23-11, wosr, td 3194 ft. U. S. 2, 31-23-11, dk. U. S. 3, 31-23-11, lcn. U. S. 4, 31-23-11, lcn. Bahan & Bahan et al's Pleasant 1, 25-23-12, dk. May 1, 26-23-12, rig up. Delaware La. Dev. Co.'s Bolinger 2, 31-23-11, arr to set 4½-in cas 3125 ft. Bolinger 3, 38-23-11, old well arr deepen. Greenwood Prod. Co.'s Bolinger 1, 36-23-12, rig up to deepen. Lide et al's Farrington 1, 23-23-12, dk. Love et al's Allen 1, 30-23-11, dk. Woodley et al's Roberson 1, 22-23-12, rig up. L. & A. 2, 14-23-12, old well rig up to deepen td 3081 ft. C. L. West et al's Sentell-Dickson 1, 3-20-13, sd 1110 ft. Lanier et al's Le Rosen 1, 26-21-14, dk pat. Nell & Lanier's Bisdenharn 1, 23-21-14, wosr 998 ft. Walker et al's Antrim 1, 28-21-13, sd 3184 ft. Jacob Laskin, Tr.'s Pardee 2, 3-22-11, wosr 2655 ft. Morgan et al's Weatherbee 2, 28-19-11, dr 2861 ft. Sam Gold et al's McFarlin 1, 7-19-13, coring red shale, strks sand 2564 ft. Muslow Oil Co.'s Barnett 1, 25-23-11, old well arr to deepen td 3076 ft. Goodman-Johnson's Martin 1, wosr td 3169 ft. Muslow Oil Co.'s Marks Meyer 1, 36-23-11, old well arr deepen 3088 ft. Kilgore C-1, 31-23-11, set 4½-in cas 3150 ft, setting tub with pckr td 3167 ft. Northwest La. Nat. Gas Co.'s Bolinger 5, 38-23-11, rig up. Magnolia Pet. Co.'s Rogers A-1, 21-23-12, set 5¾-in cas 3178 ft, showing for 6 or 7 bbls oil daily, wo td 3304 ft. La. Pet. Co.'s Peyton 2, 25-23-12, dr 1900 ft. Peyton 3, 25-23-12, coring 3114 ft. Palmer Corp.'s Robinson 1, 26-23-12, set 4½-in cas 3155 ft, 1000 ft fluid in hole, td 3175 ft. Texas Co.'s J. W. Peyton 2, 25-23-12, dk. J. W. Peyton 3, 30-23-11, dr 1250 ft. Muslow Oil Co.'s Kilgore B-1, 31-23-11, setting 4½-in cas 3134 ft, 20 ft sand. Texas Co.'s Wilkinson 1, 36-23-12, old well rig up to deepen.

CADDO PARISH—C. W. Robinson's Wilson 1, 2-15-16, rig up. Texas Co.'s Henderson 1, 16-19-15, in broken lime 2723 ft, arr abn. Sam Gold et al's Hunter 3, 17-19-14, wosr td 2457 ft. I. N. Pharris, Tr.'s Oden 1, 19-19-14, set 6⅝-in cas 2379 ft, td 2409 ft. Standard Oil Co. of La.'s Hunter 3, 17-19-14, set 6-in cas 2360 ft. Old River Oil Corp.'s Sibley 1, 15-19-14, wosr td 2495 ft. Dixie Oil Co.'s Dickson 1, 10-19-14, dk. R. W. Norton's Hill 1, 33-23-16, sd wo 4496 ft.

CLAIBORNE PARISH—El Dorado Chief Oil Co.'s Simmons 1, 27-20-7w, sd in shale and bldrs 2240 ft. Triangle Drilling Co.'s Kilpatrick 1, 7-19-5w, set 9-in cas 4266 ft, cored granular lime formation 4355-71 ft, tested 1 mil ft gas by siphon method, arr to deepen.

CONCORDIA PARISH—Joe Marr et al's Maxwell 1, 35-3-8e, set 12½-in cas 130 ft, sd high water.

DE SOTO PARISH—Benson O&G Co.'s Harris 1, 6-10-13, set 6⅝-in cas 3070 ft, dr lime 3450 ft. R. O. Roy's Farmer E-1, 5-13-13, dr 1985 ft. Farber B-1, 8-13-13, dk. Benedum & Trees' Johnson 1, 7-11-13, base chalk 1835 ft, dr 2325 ft.

FRANKLIN PARISH—Evansville Inv. Co.'s Welsch 1, 2-14-8e, dr 1400 ft. Franklin O&G Co.'s O'Brien 1, 7-15-9e, set 12½-in cas 208 ft. Davis et al's Moore 1, 12-11-6e, sd 1430 ft.

MOREHOUSE PARISH—P. J. White's Wymond 1, 32-19-6e, sd 3025 ft.

NATCHITOCHES PARISH—S. D. McDaniels' Clark-Morse 1, 23-5-6w, sd 2436 ft. Robeline O&G Co.'s Winn 1, 7-8-9w, dr sandy shale 1600 ft. Nicholas & Wilder's Clark 1, 10-10-8w, arr resume dr td 2110 ft.

OUACHITA PARISH—J. L. Bullock, Tr.'s West Va. 1, 25-18-5e, sd 2700 ft.

RAPIDES PARISH—Ayers Bros.' Kicklipp 1, 9-5n-2w, sd 2650 ft.

RED RIVER PARISH — W. D. Ball's Krumbholz 1, 32-14-10, sd high water, td 1560 ft. Eylers O&G Co.'s Johnson 1, 17-12-10, set 8-in cas 2580 ft, three and one-half million ft gas td 2752 ft.

RICHLAND PARISH—Richland O&G Co.'s Singletary 1, 20-18-7e, set 9-in cas 970 ft. Austin & McDonald's Millsaps 1, 17-17-6e, sd 2697 ft. Millsaps 3, 16-17-6e, sd 2477 ft. Millsaps 4, 16-17-6e, lcn. Millsaps 5, 8-17-6e, dk. Hunt 1, 13-17-5e, dk. Industrial Gas Co.'s Hodge 1, 7-16-7e, fsh ds 2874 ft. A. T. Davidson 1, 6-16-7e, sd wo 2762 ft. Ruston Drlg. Co.'s Hodge 1, 7-16-7e, sd wo 2600 ft. Triangle Drilling Co. & Woodley Pet. Co.'s Cumpton 1, 16-17-6e, junked abn td 2889 ft. Woodley Pet. Co.'s Buie 1, 32-18-7e, dry abn td 3280 ft. S. R. Humble's Binion-Sartor 1, 20-17-6e, heading well td 2481 ft. Palmer Corp.'s Miles 2, 17-17-6e, set 6-in cas 2316 ft. W. C. Feazel's Landrum 1, 6-16-7e, dk. Shreveport Contractors' Buie 1, 17-15-7e, sd in black shale 2527 ft. International Gas Pro. Co.'s LaGrons 1, 7-16-7e, lcn.

SABINE PARISH—Sabine O&G Co.'s Anderson 1, 19-8-12, sd for fuel 2505 ft. Benedum & Trees' Bowman-Hicks A-2, 3-7-12, dr 1605 ft. R. L. Gay, Tr.'s Bowman-Hicks 6, 14-7-14, set 8¼-in cas 2090 ft, topped chalk 2102 ft, tested dry 2375 ft, arr deepen. Sabine Lbr. Co. 3, 13-7-14, set 8¼-in cas 2090 ft, 200 ft oil in hole, wo td 2255 ft. A. H. Tarver et al's Long-Bell Lbr. Co. 2, 18-8-13, arr deepen td 1967 ft. State Bank 1, 27-8-12, dr 1550 ft. Olsan Bros.' Hooker 1, 27-8-12, topped chalk 2357 ft, set 6⅝-in cas 2333 ft, shot formation 250 ft oil in hole, wosr td 2625 ft. Ohio Oil Co.'s Bowman-Hicks 1, 35-8-12, elev 3007 ft, topped chalk 2392 ft, set 6⅝-in cas 2385 ft, hfo making occasional heads, wosr td 2405 ft. Bowman-Hicks 2, 33-8-12, set 6⅝-in cas 2360 ft, 60 ft oil in hole, wo td 2442 ft. Benedum & Trees' Bowman-Hicks 3, 34-8-12, dk pat. Bridges-Clark Oil Co.'s Gay 1, 3-9-12, dr 1650 ft. Louisiana O. R. Corp.'s Hughes 1, 36-8-12, setting 8-in cas 2406 ft (formerly carried as J. C. Tippett's test). Lion O. R. Co.'s Sabine Lbr. Co. 1, 31-8-12, set 10-in cas 100 ft. Ruston Drilling Co.'s Holliday 1, 35-8-12, setting 6⅝-cas 2322 ft. Bowman-Hicks 1, 4-7-12, dr 450 ft. Bowman-Hicks A-1, 35-8-12, dk. Bowman-Hicks A-2, 35-8-12, dk pat. Warner Quinlan Co.'s Peterson 1, 26-8-13, dr 1980 ft. Sabine Lbr. Co. 1, 34-8-12, setting 8⅛-in cas 2326 ft. Sabine Lbr. Co. 2, 34-8-12, lcn. Stovall Drlg. Co.'s Lefkovitz 1, 33-8-12, dk. (formerly carried as Usinovitch et al's test). La Grande et al's Haley 1, 6-7-12, set 6⅝-in cas 2130 ft, arr drill in. Giaque 1, 6-7-12, lcn. D. H. Reddick, Tr.'s Scretchfield 1, 18-9-12, dr 2205 ft. W. D. Ball's Long-Bell Lbr. Co. 1, 35-8-13, lcn. Haynes Bros.' Meyer 1, 28-8-12, topped chalk 2288 ft, set 6⅝-in cas 2288 ft, bldg standard rig to drill in with cable tools, td 2316 ft. Amerada Pet. Corp.'s Bowman-Hicks 1, 33-8-12, topped chalk 2340 ft, set 6⅝-in cas 2333 ft, bailed dry 2364 ft, bailed and swabbed oil 2456 ft, oil rose 300 ft in hole in 10 hours, td 2456 ft. Lide et al's Sabine Lbr. Co. 1, 31-8-12, set 6-in cas 2182 ft. J. M. Bridges' McWilliams 1, 30-10-11, dr 275 ft.

TENSAS PARISH—Willis et al's Curry 1, 39-11-12e, set 10-in cas 80 ft, sd 650 ft.

UNION PARISH—Fred Stovall's Stovall 1, 32-23-4e, rig up.

WEBSTER PARISH—F. F. Fuller's Monzingo 1, 27-18-8e, sd 600 ft. Pat Hudson's Gardner 1, 1-22-11, dk. B. L. Slack 1, 36-23-11, rig up. E. W. Bateman's Womble 1, 1-22-11, 1200 ft fluid in hole, some water, td 2712 ft. Womble 2, 1-22-11, set 6-in cas 2701 ft, 15 ft oil in hole, 4 ft sand, td 2715 ft. Magnolia Pet. Co.'s Denman 2, 1-22-11, dr 0265 ft. Baker 1, 35-23-11, dr shale 3289 ft. Phillips Pet. Co.'s Bolinger 4, 30-23-11, sr to set 6⅝-in cas 3117 ft, 5 ft sand td 3124 ft. Sarepta Oil Co.'s Gardner 1, 1-22-11, 600 ft fluid in hole, td 2719 ft. Paul C. Warren's Martin 1, 20-20-9, sd 1934 ft. Merrett & Merrett, Inc.'s Boucher 1, 17-23-11, rig up. Donohoe Oil Co.'s Roseberry 1, 19-23-9, sd 104 ft.

WEST CARROLL PARISH—Palmer Corp.'s Marston A-1, 11-19-10e, setting 6-in cas 2390 ft. H. L. Hunt's Brown 1, 4-21-11e, rig up.

OKLAHOMA

WOODS COUNTY—T 8n, R 16w, Sec. 23, Peerless, Cromwell 1, c nw ne, dr 2945 ft, 3250 ft.

GRANT COUNTY—T 28n, R 7w, Sec. 27, Gypsy's Bilderback 1, se cor, sd 5295 ft, dlg 5445 ft. T 28n, R 4w, Sec. 12, Boucher et al's Dedman 1, sw c se; hfw 3105-30 ft, sd 4735 ft.

WOODS COUNTY—T 27n, R 16w, Sec. 33, Sinclair's Share 1, c ne sw, fsg 6334 ft, dlg 6491 ft.

ALFALFA COUNTY—T 27n, R 11w, Sec. 12, Smith Bros.' Forbes 1, nec se nw nw, sd 1420 ft.

HARPER COUNTY—T 26n, R 24w, Sec. 14, Sinclair's Howell 1, c sw sw, drlg 6658 ft, 6837 ft.

GRANT COUNTY—T 26n, R 3w, Sec. 23, Otstot Dev. Co.'s Tapor 1, nec se, hfw 3100-25 ft, sd 3250 ft.

KAY COUNTY—T 26n, R 2e, Sec. 32, J. A. Vincent and Nat'l Union's McNeal 1, nwc ne, sd 2795 ft.

WOODS COUNTY—T 25n, R 15w, Sec. 10, Bu-Vi-Bar et al, Fee 1, sec sw, fsg 6104 ft.

GRANT COUNTY—T 25n, R 4w, Sec. 22, Cowden, Volmer 2, nec se ne sw, lost tools, sd 5640 ft.

ALFALFA COUNTY—T 24n, R 11w, Sec. 14, J. V. Bailey et al, Acre 1, c sw ne, water 4649 ft, r.u.s.t 46660 ft.

GARFIELD COUNTY—T 24n, R 6w, Sec. 9, Pulse & Beamer, White 1, sec nw, hfw 4730-4800 ft, sd 5556 ft.

WOODWARD COUNTY — T 23n, R 20w, Sec. 9, Harris & Haun, Wyatt 1, c se, drlg 5240 ft, 5275 ft.

GARFIELD COUNTY—T 23n, R 4w, Sec. 32, Shell et al, Loomis 1, c nw nw, sd 200 ft.

NOBLE COUNTY—T 22n, R 1w, Sec. 28, Gypsy et al, Bertram 1, sec nw, bldg rig. T 22n, R 1e, Sec. 22, Peerless et al, Wentz 1, nwc sw, Layton sand 3279-82 ft, averaged 85 bbls three days, sd temp for tankage.

WOODWARD COUNTY — T 21n, R 21w, Sec. 25, Sharon, Elmore 1, swc, sd 3025 ft, rig blown down. T 21n, R 19w, Sec. 19, Burgoyne Bros., Marklin 1, swc se ne, sd 1910 ft.

MAJOR COUNTY — T 20n, 14w, Sec. 23, Keller et al, Horton 1, c ne ne, spudded and sd.

GARFIELD COUNTY—T 20n, R 4w, Sec. 10, Continental et al, Brown 1, cel ne nw sw, show gas 3145-62 ft, r.u.s.t 4625 ft, 8-inch 4721 ft.

BLAINE COUNTY—T 19n, R 10w, Sec. 13, Washoma, Phillips 1, c nw sw, sd 2945 ft.

LOGAN COUNTY—T 18n, R 3w, Sec. 33, Healy et al, Quier 1, sec sw, sd 3970 ft. T 17n, R 4w, Sec. 34, Currie et al, Katcher 1, swc ne sw, cellar.

KINGFISHER COUNTY — T 16n, R 7w, Sec. 6, Gault-Brown, Boch 1, c nw se, (owdd) sd 6022 ft.

OSAGE COUNTY—T 29n, R 6e, Sec. 29, Duffield & Howard et al, 1, nec nw, spudded and sd. T 24n, R 5e, Sec. 24, Continental Oil Co., 1, nwc se se, sd 801 ft.

PAWNEE COUNTY—2 23n, R 5e, Sec. 15, Cochran et al, McFadden 1, nec sw, rig. T 21n, R 7e, Sec. 32, Turner et al, Niccum 1, sec ne se, rigged up and sd.

PAYNE COUNTY—T 18n, R 4e, Sec. 6, F. M. Marrs et al, Tietz 1, swc nw se, lcn. T 17n, R 4e, Sec. 4, Wheeler & Mote, Funnell 1, nec se, drlg 830 ft.

LINCOLN COUNTY—T 17n, R 5e, Sec. 16, Jilson & Kemp, School Land 1, sec sw, drlg 1402 ft. T 13n, R 6e, Sec. 21, Shell, Pharris 1, nec nw, sand 4295-98 ft, 1400 ft oih, sd 4337 ft, drlg 4352 ft.

OKFUSKEE COUNTY—T 13n, R 9e, Sec. 15, Erwin and others, Allen 1, sec sw ne, spudded and sd. T 12n, R 9e, Sec. 36, Henry Oil Co., Harjo 1, nwc, sd 2785 ft. T 12n, R 10e, Sec. 13, Shepperd et al, Shepperd 1, sec nw sw, 3660 sd. T 10n, R 10e, Sec. 25, Transcontinental et al, Lasley 1, swc nw, lcn.

MUSKOGEE COUNTY—T 11n, R 19e, Sec. 21, E. Mills et al, Martin 1, nwc se, sd 1001 ft.

McINTOSH COUNTY—T 10n, R 14e, Sec. 31, Jennings Bros., Crabtree 1, sec nw sw, show gas 4100 ft, ur 6-inch.

PITTSBURG COUNTY—T 9n, R 16e, Sec. 32, Pattison et al, McDuff 1, swc nw se, wx 5443-5511 ft, show oil 5446-70 ft, 1M gas 5464-80 ft, sand 5556-60 ft, fshg.

HASKELL COUNTY—T 9n, R 18e, Sec. 10, Marion Oil Co., Sanders 1, nwc ne sw, sd 2692 ft.

LATIMER COUNTY—T 7n, R 22e, Sec. 36, J. S. Cochran et al, Cushing 1, nwc se se, sd 2100 ft. T 6n, R 22e, Sec. 23, Limestone O&G Co., Shaw 1, nwc ne nw, sd 1700 ft, co.

OKLAHOMA COUNTY—T 13n, R 1w, Sec. 13, Tom Slick, Martin 1, c nw nw, td 6964 ft, water, recementing, r.u.s.t. T 13n, R 3w, Sec. 35, Magnolia et al, Johnson 1, ne ne sw, drlg 4365 ft. T 12n, R 2w, Sec. 30, Magnolia Noble

1, nwc sw sw, drlg 7160 ft, fish 7173 ft. T 11n, R 2w, Sec. 3, Ryan Consolidated, Lawton 1, ne nw, fishg 3985 ft, drlg 4245 ft.

POTTAWATOMIE COUNTY—T 6n, R 3e, Sec. 22, Payne Drlg. Co., Bullock 1, sec ne, td 3940 ft, r.u.s.t. T 6n, R 3e, Sec. 36, Sykes et al, Cook 1, sw nw ne, rig.

CLEVELAND COUNTY—T 6n, R 1e, Sec. 20, Brownfield, Corbett 1, c sw ne, r.u.r., sd 540 ft.

McCLAIN COUNTY—T 5n, R 3e, Sec. 16, Homaokla Oil Co., Newsome 1, sec ne ne, pump 46 bbls 3587-91 ft, td 3607 ft, completed.

HUGHES COUNTY—T 9n, R 12e, Sec. 29, Canady, Canard 1, nwc sw, 1M gas 2815 ft, sd.

POTTAWATOMIE COUNTY—T 8n, R 4e, Sec. 30, Keister & Manning, Towlett 1, swc se ne, 8-inch at 4254 ft.

SEMINOLE COUNTY—T 8n, R 5e, Sec. 23, Gypsy et al, Bruner 1, nec se nw, 8-inch at 4207 ft, 1000 ft water 4323-36 ft, pb. Sec. 26, Continental et al, Harjo 1, nwc se, sand 4414-31 ft water, to pb, dry & abn. T 6n, R 6e, Sec. 6, Mid-Continent, Talahoke 1, sec nw, r.u.r. Sec. 19, Superior, Morgan 1, sec, r.u.r., set surface pipe. T 6n, R 8e, Sec. 31, Magnolia, Reed 1, nec se nw, drlg 2420 ft, show oil 2578-2684 ft, to set 9-inch.

ROGER MILLS COUNTY—T 12n, R 24w, Sec. 23, Bucy & Stone, Williams 1, c sw, cemtd surface pipe, sd. T 11n, R 26w, Sec. 4, L. C. Hivick, Davis 1, c nw ne, sd 2840 ft.

CANADIAN COUNTY—T 10n, R 6w, Sec. 1, J. V. Bailey, Robinson 1, c ne nw, sd 15 0ft.

BECKHAM COUNTY—T 8n, R 22w, Sec. 20, Carson et al, Denby 1, swc se ne, sd 1700 ft.

GREER COUNTY—T 6n, R 24w, Sec. 17, I.T.I.O. et al, Fee 1, c ne, sd 2090 ft, drlg 2100 ft. Sec. 23, Helmerich & Payne, 1, c nw nw, sd 2210 ft, tools in hole.

CADDO COUNTY—T 6n, R 13w, Sec. 8, Abernathy et al, Horton 1, sec, sd 580 ft.

COMANCHE COUNTY—T 3n, R 9w, Sec. 3, Okla. Nat. Gas Co., Doebel 1, nec sw sw sw, sd 150 ft.

STEPHENS COUNTY—T 2n, R 8w, Sec. 30, Smythe & Nash, Johnson 1, nec, sd 2483 ft.

COTTON COUNTY—T 2s, R 9w, Sec. 8, Thomas Medlin, Johns 1, swc se, sd 1260 ft.

STEPHENS COUNTY—T 3s, R 9w, Sec. 22, Pelwin et al, King 1, swc se (owdd) sd 3180 ft.

JEFFERSON COUNTY—T 5s, R 7w, Sec. 11, H. W. Lee, Hotubbi 1, sec nw, (owdd), sd 2513 ft.

HUGHES COUNTY—T 5n, R 10e, Sec. 30, Erwin et al, Jones 1, sec ne, rig. T 5n, R 11e, Sec. 15, J. J. Wright, Roberts 1, sec sw, r.u.s.t.

GARVIN COUNTY—T 4n, R 1e, Sec. 11, W. H. Peckham et al, Mullins 1, c w½ w½, moving in tools, drlg 50 ft. T 4n, R 3e, Sec. 10, C. R. Obermyer, Stricklin 1, nec sw, sd 140 ft.

PITTSBURG COUNTY—T 4n, R 12e, Sec. 32, Kerr & Key, Tall 1, c nw nw, sd 3502 ft.

ATOKA COUNTY—T 3s, R 10e, Sec. 18, Brookshire et al, Guinn 1, nwc nw, sd 80e ft.

CARTER COUNTY—T 4s, R 2e, Sec. 32, Tex-Okla Drlg. Co., Anderson 1, sec ne se, fishg 1980 ft.

MARSHALL COUNTY—T 5s, R 5e, Sec. 17, Jordan et al, Penn Mutual Life Ins. Co. 1, nwc ne se, sd 700 ft.

BRYAN COUNTY—T 9s, R 9e, Sec. 36, W. C. Endicott et al, Craig 1, c nw ne, sd 2025 ft.

WOODWARD COUNTY—T 23n, 17w, Sec. 23, The rPairie O&G Co. et al, Wilbur 1, nec, drlg 6040 ft.

CLEVELAND COUNTY—T 10n, R 2w, Sec. 8, Prairie, Slick and Phillips, Sudik 1, c ne ne, sd 7720 ft.

SOUTHERN CALIFORNIA

BANDINI—George F. Getty's Kellam 1, dr shale 2475 ft.

BELLFLOWER — Clearwater Pet. Co.'s Candler 1, dr shale 4260 ft.

CALABASAS — J. W. Martin's 1, dr sand and shale 1082 ft. Olympic Pet. Corp.'s 1, dr hard shale 585 ft.

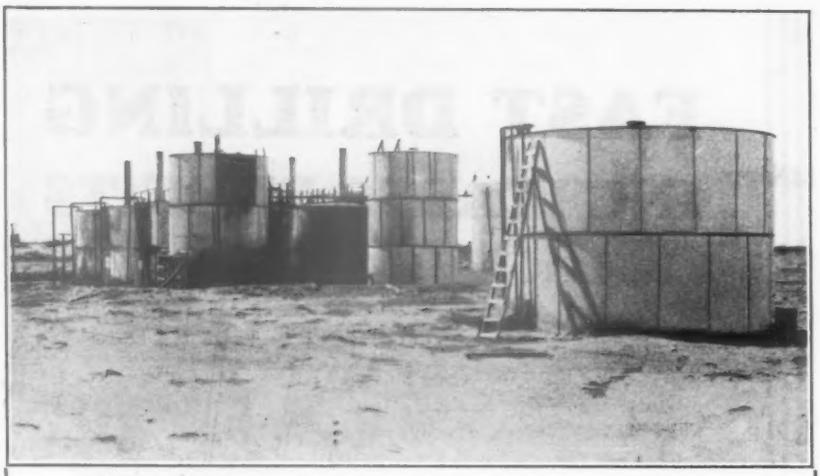
COMPTON—California Well Drilling Co.'s Del Amo 1, to test at 8500 ft.

EL MONTE—Morgan West's Sing 1, dr sandy shale 1750 ft.

FULLERTON—Shell's Bastanchury 1, re-dr 4925 ft. Standard's Batanchury 1, co 4215 ft.

LA HABRA — Union's Sansinena 11, re-dr 1250 ft.

NEWHALL—Consolidated Oil Co.'s Ham-



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mond 1, dr shale 1205 ft. National Security Oil Co.'s Shepherd 1, running 8⅝-inch cas to 875 ft.

NEWPORT — Mesa Pet. Corp.'s B. G. 1, plugged to 3445 ft.

PIRU—Coastline Oil Co.'s Mazie 1, plugged to 2050 ft.

POINT DUME—Raleigh Oil Co.'s Rindge Ranch 3, dr hard sand 3700 ft.

POMONA—Grimes-Girrard Syn.'s 1, dr sand 400 ft.

PUENTE—State Oil Co.'s Richfield Puente 1, dr hard sand 4105 ft. Western Gulf's Diamond Bar 1, dr hard sand 2666 ft.

SOUTH LOS ANGELES—William Diller's 1, sr 3328 ft. George Hanners' Stallman 1, abn 3610 ft.

TELEGRAPH CANYON—Union's Rimpau 1, dr hard rack 2675 ft.

WHITTIER—Tureco Oil Co.'s Cole 1, lcn.

WILMINGTON—Archer Oil Co.'s Watson 1, circulating 5565 ft.

RIVERSIDE COUNTY — L. R. Clark's 2, 5-3-2, re-dr 2266 ft. Hemet Pet. Co.'s Ward 1, dr shale 3535 ft.

SAN BERNARDINO COUNTY — J. W. Sherman's Rancho 1, dr shale 722 ft. Urmi Oil Co.'s Schih-Zellers 1, 31-2-8, dr coarse sand 1465 ft. Western Pacific Oil Co.'s 3, 4-10-4, trying to plug off bottom water, td 3370 ft.

SAN DIEGO COUNTY—Borderland Exploration Co.'s Point Loma 1, lcn; No. 1, dr gray sand 2212 ft.

NORTHERN CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
MADERA COUNTY—		
George F. Getty's Gill 1, 18-13-16..	*	4615

KERN COUNTY

BELRIDGE—Elmer Oil Co.'s No. 1, 2-29-20, pulling liner, td 3975 ft. J. H. Kennedy's No. 1, 5-29-21, dr shale 1107 ft. K. C. Wallace's No. 1, 32-29-21, running 6¼-inch cas, td 2575 ft.

BUTTONWILLOW—Lincoln Drilling Co.'s No. 1, dr shale 200 ft. Milham Exploration Co.'s Kern 6, 8-28-23, m on iron 4945 ft.

EDISON—F. M. Sayre's No. 1, 5-30-29, dr hard sand 2850 ft. Shell's No. 2-1, 33-29-29, dr sand 315 ft. Texas' Newman 1, 23-29-28, dr shale 5441 ft.

GOULD HILLS—Casa Mira Oil Co.'s Theta 1, 20-28-20, dr shale 2909 ft.

McKITTRICK—Ozena Oil Co.'s Kendon 2, 27-29-21, running 6¼-inch cas to 2490 ft. Ohio's M. M. 1, 32-20-22, dr shale 2840 ft. H. L. Whiston's Wisecarver 1, 30-30-22, ready to dr out cmt, td 4195 ft; Monarch 1, 34-30-22, new lcn.

MIDWAY—Shell's Perris 1-A, 15-32-23, coring 8150 ft. Standard's Mascot 1, 26-32-23, dr shale 8800 ft. Texas' Gore 4, 21-31-22, dr shale 3888 ft.

ROUND MOUNTAIN—Gerrard and Phillips' No. 1, 32-27-29, re-dr 750 ft.

SHALE HILLS—Girard Oil Co.'s No. 1, 28-26-18, rig.

TEMBLOR HILLS—Shell's Gonyer 1, 32-32-23, plugged to 1745 ft, tested wet.

WEED PATCH—Shell's Porter Day 1, 29-30-29, grading for rig.

SANTA BARBARA COUNTY

ARROYA PARIDA—Shell's Fithian 1, 18-4-25, sr 2080 ft.

BUELL CANYON — Union's Buell 1, dr shale 3350 ft.

CARPENTERIA—Continental's Kitty Bailard 1, dr 150 ft.

CASITAS PASS—Standard's Shepard 1, 26-4-25, dr gray sand 670 ft.

CASMALIA—Wildcat Oil and Royalty Co.'s Donovan 1, 20-10-35, making prod test, td 4250 ft.

GOLETA—Walter Barnhart's Pomatto 1, 1-4-29, co 1300 ft, td 2155 ft. Carrey and Adams' Montecito 1, 1-4-28, dr gray sand 2840 ft. General Pet.'s Crandall 138-1, dr shale 1368 ft; James 136-1, dr shale 717 ft; More 2, dr shale 3926 ft. Standard's Edwards 2, dr shale 2605 ft. U. S. Pet. Corp.'s Permit 143-1, dr shale 707 ft.

LOMPOC—Ohio's Holilster 1, 2-6-34, dr hard sand 666 ft.

LOS OLIVAS—L. B. Tannehill's McGilvray 1, 23-7-31, dr shale 3128 ft.

ORELLA—General Pet.'s Erburu 3, dr gray

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sand 1616 ft. Oakburn Oil Co.'s Permit 168-1, dr shale 400 ft; Permit 171-1, dr shale 200 ft.

POINT CONCEPCION—Standard's Gerber 1, dr gray sand 3800 ft.

SAN MARCOS—California Oil Properties' Fortine 1, 3-4-28, plugged to 3805 ft, to make final test, may abn.

SANTA MARIA — Fields Gasoline Co.'s Bradley 1, pumping about 50 bbls oil, td 5267 ft. Shell's Careaga 1, coring 4707 ft.

VENTURA COUNTY

FILLMORE—Frank Oil Co.'s No. 1, 35-4-20, testing water shutoff, td 2076 ft.

CONEJO—Triunfo Oil Co.'s No. 1, 24-1-19, co 1620 ft.

OJAI—Continental's Sulphur Mountain 3, 21-4-22, 6⅝-inch cas cmt 6195 ft, td 6225 ft. Gilmore-Bishop Pet. Co.'s Pirie 1, pumping some oil, td 2075 ft. M. K. T. Oil Co.'s No. 1, 13-4-22, dr shale 4482 ft.

OXNARD—Shell's Leonard 1, coring 3600 ft; Terry 1, coring 3100 ft.

PIRU—Bolsa Chica Oil Corp.'s Snow 1-A, 4-4-18, dr shale 1666 ft. E. A. Fennell's Lankershim 1, 13-4-19, dr shale 728 ft.

HOPPER CANYON — George H. Hadley's No. 1, 13-4-9, dr shale 404 ft.

RINCON CREEK—Associated's Snowball 1, 19-4-24, 20-inch cas cmt 500 ft.

SANTA PAULA — San Pedro-Pt. Fermin Sny.'s Kellerman 1, 13-4-21, swabbing oil, td 3360 ft.

SATICOY—Standard's Citrus 5, 10-2-22, re-dr 8328 ft.

SOMIS — Shell's Everett 1, nw¼ 23-2-20, new lcn.

MISCELLANEOUS

FRESNO COUNTY — Currency Pet. Co.'s No. 1, 28-21-14, dr sand 3300 ft. Western Gulf's Welsh 1, 26-15-12, rigging up.

KINGS COUNTY—H. B. Porter's No. 1, 9-24-17, dr shale 2515 ft. J. E. O'Donnell's No. 1, 7-23-20, testing water shutoff of 11¾-inch cas, td 1882 ft.

MENDOCINO COUNTY — Twin State Oil Co.'s Soldani 1, 14-12-17, dr gray sand 1990 ft.

MONTEREY COUNTY — Standard's Piedmont 1, 23-22-7, dr hard sand 2515 ft. Union's Paige 1, 8-22-8, dr brown shale 2710 ft. Shell's Dudley 1, 15-22-9, co 3950 ft, td 5470 ft.

SAN LUIS OBISPO COUNTY—Panorama Oil Co.'s Panorama 1, 7-31-21, cutting and pulling 6¼-inch cas, td 4010 ft. Midwest Oil Co.'s Hately 1, 34-31-15, dr gray sand 3175 ft. Pismo Dome Oil Co.'s Pricco 2-A, 5-31-13, dr shale 1300 ft; No. C-1, 5-31-13, fsh 1105 ft. San Luis Syn.'s No. 1, 29-31-12, dr shale 3475 ft. Texas Pacific Coal & Oil Co.'s No. 1, 25-32-14, dr shale 4007 ft. Union's Chandler 1, 12-32-14, dr hard shale 5275 ft.

TULARE COUNTY—Terra Bella Oil Co.'s Gardiner 1, 35-22-27, dr shale and streaks oil sand 878 ft. Roy White's No. 1, 8-23-26, dr gray sand 3155 ft.

ARKANSAS

ASHLEY COUNTY—Ark. Fuel Oil Co.'s Crossett Lbr. Co. 1, 1-19-7, dr hard sandy lime 3148 ft.

COLUMBIA COUNTY — L. E. Parker's Franks 1, 25-19-22, sd 2831 ft. Williams et al's Fullenwider 1, 12-17-22, rigged up ready to sp.

CLEVELAND COUNTY—Craver & Walker's Fee 1, 33-11-9w, sd 60 ft.

CLEBURNE COUNTY — Cosden Oil Co.'s Donithan Lbr. o. 1, 19-9-10, dr 1275 ft.

DREW COUNTY—McClintock & Goedke's Ogle 1, 33-13-5, sd in new hole 1810 ft, td old hole 2530 ft.

FAULKNER COUNTY—Gold Creek O. & G. Co.'s Stermer 1, 17-4-13, ta 3872 ft; Stermer 2, 17-4-13, sp, no report.

FRANKLIN COUNTY — Ozark Nat. Gas Corp.'s McElroy 1, 15-8-27, arr plug back, td 3100 ft.

GARLAND COUNTY—H. H. Given's Garrett 1, 1-13-19w, dr hard sand 3397 ft.

GRANT COUNTY—Jones & Watkins' Meek 1, 5-4-11, ta 1400 ft.

JOHNSON COUNTY—Ark.-La. Pipe Line Co.'s Patterson 1, 14-10-14, set 13⅝-inch cas 1500 ft, dr shale 1640 ft. Blackwell O. & G. Co.'s Wyver 1, 21-8-25, ta 5360 ft.

LOGAN COUNTY—M. W. Greesom's Perk 1, 21-8-24, lcn.

LAWRENCE COUNTY — Marguerite Dev. Co.'s Broadway 1, 31-17-1, lcn.

LITTLE RIVER COUNTY—Grote et al's Allen 1, 31-12-31, ta 2941 ft. C. F. McDonald's Black 1, 12-13-29, sd 1965 ft. Buck Oil Co.'s Taafe 1, 23-21-32, dr lime 2175 ft.

MADISON COUNTY—Phillips et al's Skinner 1, 11-14-28, arr resume dr, td 1461 ft.

NEVADA COUNTY — Copenhaver et al's Warwick 1, 2-15-17, ta 2190 ft. Anderson & Winner's Buck 1, 7-15-17, old well resumed, dr 2605 ft (formerly owned by Flaucher et al). Artex Oil Co.'s Smith 1, 31-15-17, tested 60 joints sw through ds at 3077 ft, dr red beds 3166 ft. A. P. Smith et al's Reynolds 1, 21-14-17, coring 1689 ft. La. O. R. Corp.'s Tucker 1, 15-15-19, set 5-3/16-inch cas 2186 ft, td 2239 ft. Magnolia Pet. Co.'s Grayson 1, 21-15-19, tested 6 joints oil and mud through ds 1474-78 ft, set 8⅛-inch cas 1466 ft, td 1478 ft.

PIKE COUNTY—Theo. Davis, Tr.'s Ruth Wilson 1, 25-5s-26w, sd 718 ft.

POPE COUNTY—Cosden Oil Co.'s Mo. Pac. R. R. 1, 13-9-19w, sr td 2500 ft. Ark.-La. Pipe Line Co.'s Harns 1, 22-9-21, set 8-inch cas 300 ft, dr 1010 ft.

PRAIRIE COUNTY — Transcontinental Oil Co.'s Novack 1, 36-2-6, set 8¼-inch cas 2058 ft, dr paleozoic 2816 ft.

SCOTT COUNTY — Mansfield Gas Co.'s Norris 1, 6-4n-30w, lcn.

SEBASTIAN COUNTY—Lavaca O. & G. Co.'s Cason 3, 21-9-30, dk. J. O. Ingram 7, 22-8-30, dr 2700 ft. A. G. Williams, Jr.'s Patterson 1, 27-8-30, lcn.

ST. FRANCIS COUNTY—Brownlee Drilling Co.'s Whitted 1, 28-4-1, sd 300 ft.

UNION COUNTY — Frank Staples' Ainsworth 1, 8-19-16, sd 2090 ft. Lion O. R. Co.'s McDuffie 1, 32-19-16, ta in red beds 4506 ft. O. W. Estes' Telford 1, 35-17-15, 200 ft oil in hole, wo, td 2330 ft. Felsenthal 1, 2-18-15, sd wo 2191 ft. E. G. Bradham's Craig 1, 6-18-15, set 6-inch cas 2080 ft, dr 2144 ft. H. L. Hunt's Pratt 6, 7-18-15, running tubing 2210 ft, approx 5 ft fluid in hole. Al-Cal Oil Corp.'s Haney 1, 1-17-16, tested sw 2196 ft, coring 2197 ft. Malloy & Co.'s Robertson 3, 6-19-15, lcn. Wisinger & Ball's Lacey 1, 6-18-15, set 6⅝-inch cas 2131 ft, bailing cas; Rodgers 1, 31-17-15,

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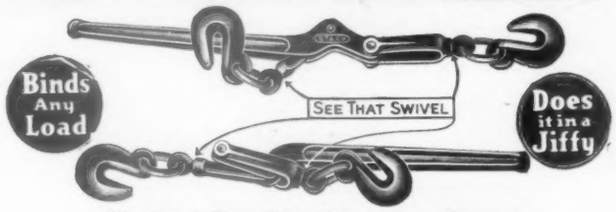

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dr 1820 ft. Malloy & Co.'s Goodwin 4, 36-17-16, dk. Lion O. R. Co.'s Ballard 1, 10-18-13, rigged up ready to sp. Johnson & Gummer's Cargile 1, 4-18-13, old well arr deepen, td 3341 ft. Federal Pet. Co. et al's Tillman 1, 9-18-13, lcn. Marine Oil Co.'s P. Winn Estate B-2, 10-18-13, lcn; Simmons 1, 1, 10-18-13, lcn; Simmons 2, 10-18-13, lcn.

WASHINGTON COUNTY — Lioncol Lease Holding Co.'s Townsite 1, 30-15-32, sd 1500 ft. C. H. Willoughby's Jones 1, 34-16-30, trying kill water flow 2150 ft. O'Hara & Shetterley's Boyd 1, 12-16-32, sd 150 ft.

WHITE COUNTY—Lentona Synd.'s Letona 1, 35-9-8, set 5-3/16-inch cas, sd 3500 ft.

VAN BUREN COUNTY — J. S. Martin's Scanland 1, 5-9-13, sd 50 ft.

MISSISSIPPI

ALCORN COUNTY—Alcorn Pet. Co.'s Matthews 1, 14-2-7, arr shoot formation 2520-60 ft, td 2735 ft.

CHICKASAW COUNTY — Hightower & Golsan's Fleming 1, 20-13-3e, driving 8¼-inch through quicksand, td 1280 ft; Fleming 2, 15-13-2e, dk pat.

CLAIBORNE COUNTY—Ben White's Old Hen 1, 26-10-4, sd 2004 ft.

HARRISON COUNTY (Gulfport Dist.)—Dalton Oil Co.'s Lopez 1, 15-7-10w, lcn.

HINDS COUNTY (Jackson Dist.) — Mrs. Ella Rawls Reeder's State Land 1, 25-6-1e, co td 2905 ft (S.L.M.) Jackson O. & G. Co.'s Mayes 1, 2-5-1e, set 10-inch cas 730 ft, set 6⅝-inch cas top chalk 2460 ft, arr drill plug (formerly carried as Cleve Love et al's test).

LAFAYETTE COUNTY—F. E. West et al's May 1, 22-10-1w, rigged up wo.

LAUDERDALE COUNTY (Meridian Dist.)—Lauderdale O. & G. Co.'s Lackey 1, 2-7-16, set 8¼-inch cas 2790 ft, arr drill plug, td 2816 ft. Meridian Nat. Gas Co.'s Mattie Houser 1, 33-8-18, running sand tester 2681 ft, td 2693 ft. Boyd Hammond's Craig 1, 2-6-14, dk.

LINCOLN COUNTY (Brookhaven Dist.)—Lincoln O. & G. Co.'s Pat Case 1, 21-8-6, sd 2221 ft.

LEE COUNTY — Lee County Pet. Co.'s Hickman 1, 12-8-6, sd 920 ft.

MONROE COUNTY (Amory Dist.)—Amory Pet. Co.'s Hall 1, set 8-inch cas 2293 ft, re-set liner to stop caving 2340 ft, dr blue gumbo 2352 ft, td old hole 3045 ft. Amory Dev. Co.'s Bourland 1, 2-13-19, sd in lime bailer in hole, td 2912 ft. Park Bowser's Cowart 1, 2-12-19, driving 12½-inch pipe 30 ft.

RANKIN COUNTY (Jackson Dist.)—Gulf Ref. Co.'s Rainey 1, 13-5n-1e, lcn.

WARREN COUNTY (Vicksburg Dist.) — Henderson et al's Dornbusch 1, 8-18-15, arr run 6⅝-inch cas over stuck drill stem, td 2475 ft.

WEBSTER COUNTY—Cumberland Oil Co.'s Henley 1, 15-21-11, retaking leases preparatory resume dr, td 1865 ft.

YALABOUSHA COUNTY (Water Valley Dist.)—J. D. Collette et al's Blackmer 1, 14-11-4w, topped red beds 2316 ft, arr resume dr, td 2433 ft.

YAZOO COUNTY—Amerada Pet. Corp.'s Campbell 1, 24-12-2, sr td 3411 ft.

ALABAMA

HOUSTON COUNTY—J. R. Sealey's Fee 1, 13-1n-27e, changing from cable tools to rotary, td 3100 ft.

LAMAR COUNTY—Briggs & Knapp's Wefel 1, 25-12-14, set 4⅞-inch cas 1658 ft, dr hard limestone 1736 ft.

LAUDERDALE COUNTY—P. J. McAlpine's O'Neal Heirs 1, 8-2s-13w, rigged up.

MARION COUNTY — P. J. McAlpine's Clark 1, 22-11-14, dk pat.

MORGAN COUNTY—DeCatur O. & G. Co.'s English 1, 6-6-4, fsh for cas, td 4130 ft.

SUMTER COUNTY—B. W. Bates' Fee 1, 3-18-1w, arr abn dry hole, td 1200 ft; Fee 2, 3-18-1w, rig up.

WASHINGTON COUNTY—Hobson et al's Wilson 1, 27-7-1w, fsh for bailer in limey shale td 881 ft. Hobson Bros. 1, 9-8-2w, sd 1450 ft. Oscar Brown's U. S. Land & Cotton 1, 26-3-2, arr to abn at 150 ft and skid over for new hole.

TENNESSEE

DECATUR COUNTY—Chester County O. & G. Co.'s Montgomery 1, set 6-inch cas 1045 ft, dr lime 1615 ft.

Shreveport, Louisiana. — Total gas production for the state of Louisiana including the southern (coastal) districts during 1929 aggregated 262,680,782,332 cubic feet as compared to 232,820,359,472 feet for the year 1928, according to figures compiled by the minerals division of the State Conservation Commission. Monroe gas fields total gas output in 1929 was 170,570,430,957 cubic feet as compared to 157,561,267,108 cubic feet in 1928. Richland Parish's gas output in 1929 was 42,017,061,570 cubic feet at compared to 9,916,625,000 feet in 1928.

Erich F. Kuehnle, consulting petroleum technologist, Houston, has moved his offices to 1118 Esperson building.

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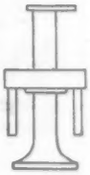

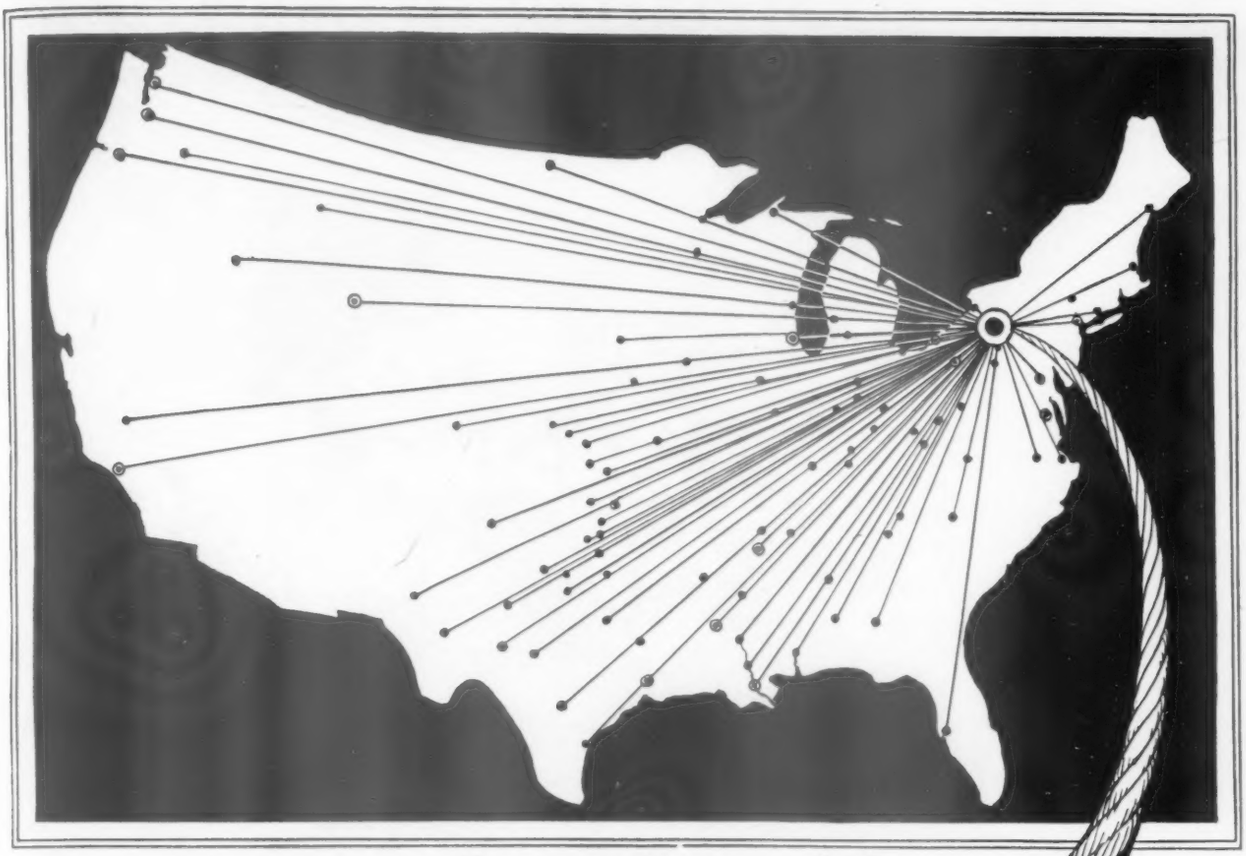

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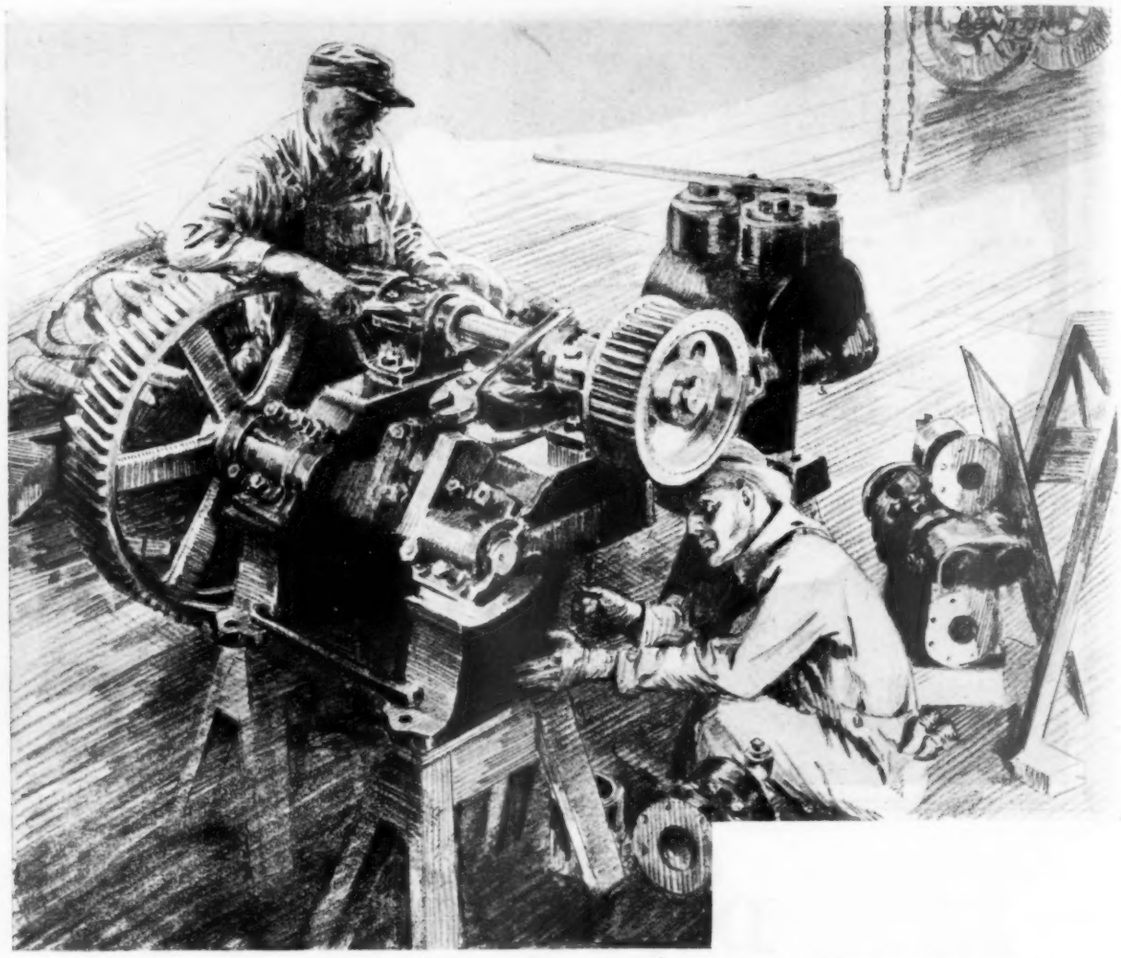

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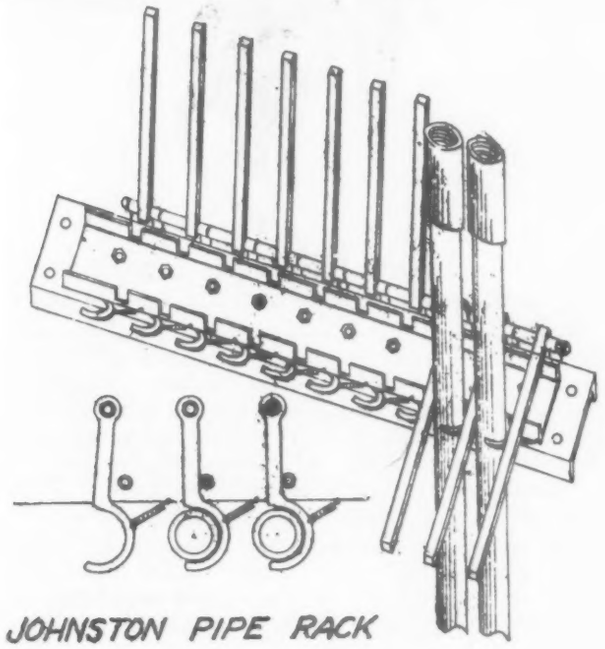


JOHNSTON PIPE RACK

Pipe Rack

E. L. JOHNSTON

E. L. Johnston, 601 West Building, Houston, has recently perfected a pipe rack, designed for providing safety and saving time in handling sections of drill pipe or tubing in the derrick.

This rack is installed in place on the sill running out from the fourble board to the side of the derrick in 20 minutes. Purpose of the rack is to set and lock a single row of five sections to block the wind or other disturbances from the other rows. It is designed and constructed to hold from 12 to 15 sections of pipe.

The base of this equipment is an eight-foot channel iron, seven inches wide. Back to back with this channel iron is a quarter-inch plate iron with nipples between the two as spacers. Chrome steel hooks for holding the first row of pipe sections are pivoted between the channel iron and plate iron, with heavy steel bolts running through both and through the eye of the hook. There are five of these hooks for five sections of pipe in the first row.

When the five sections of pipe are hooked in they are securely locked by 1⅛-inch square iron fingers which are thrown over between each section of pipe to rest in grooves in the channel iron. The square iron fingers work on hinges attached to a seven-eighths-inch iron rod, which pivots.

Aside from the set of bolts holding the hooks in place there is another set serving as a back stop for the hooks. As a section of pipe is dropped in its hook the neighboring hook moves forward to allow passing of the pipe and then is automatically returned to its place by a spring.

The Johnston pipe rack will be made in four and six-inch combination and in three and 2½-inch combination. The four six-inch rack weighs approximately 180 pounds.

More detailed information is available by writing E. L. Johnston at the address given above.

Patent is pending on the device.

Tank Ladder

COLUMBIAN STEEL TANK COMPANY

A new and distinct type of ladder or stairway for use in tanks equipped with floating decks has been designed and now is being made by the engineering department of the Columbian Steel Tank Company of Kansas City, Missouri.

Since the first floating deck was built one of the difficulties of its construction has been the ladder or stairway leading from the rim of the tank down to the floating deck. The fact that the deck may one day be close to the top of the tank and the next day be 20 feet below the rim has made the ordinary stair construction impractical as the treads, built to be horizontal at one angle may set at a 45 degree angle when the deck rises a few feet.

As a solution to this difficulty engineers of the Columbian Steel Tank Company have developed the self adjusting tread way illustrated here. The treads of this stairway remain horizontal at whatever angle the stairway stands.

When the tank is full this stairway is in a horizontal position and the treads form a level walkway.

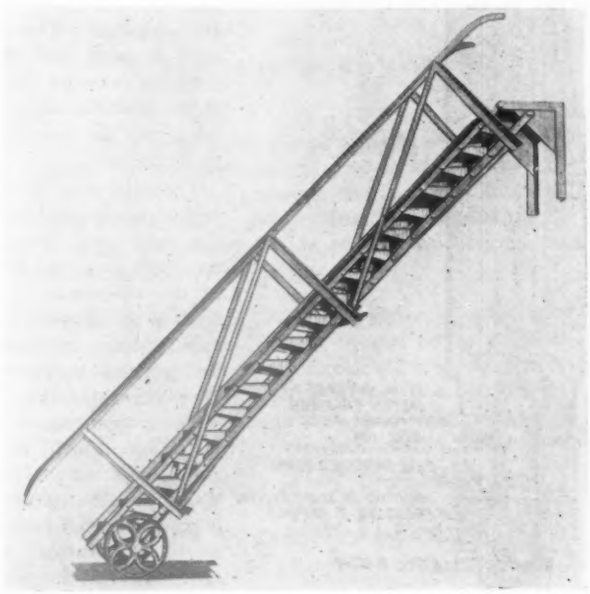
Method of Applying Drillite

NATIONAL TOOL & METALS, INC.

National Tool & Metals, Inc., Torrance, California, has a pre-welding method of applying "Drillite" which offers an increase in application speed and a reduction of waste from drip-overs and droppages. The only tool needed for the job is a paddle or stick for laying the paste onto the surface to be treated.

The original "Drillite" powder was mixed with water and made into a paste before being applied with an arc. The result of this gave a hydrogen atmosphere at the point of welding. Atmosphere tends to eliminate all porosity, slag insertions and waste matter, according to general theory and practice. When the metal was mixed into paste form it was found to run both the acetylene and the electric arc, a dual combination necessary to reduce the division of welding labor.

To obtain the new mixture a division of six parts "Drill-



Columbian Tank Ladder

ite" to one part water is made. Following the mixing, the paste is put on the cutting edge to be treated in as thick a layer as is desired, the thickness being based upon the amount of abrasive resistance specified. Once the metal is in place on the tool, the carbon arc or the acetylene flame is used to run the metal onto the surface.

An amalgamation of metals is obtained with paste "Drillite," according to the company's findings. As the metal of the bit is heated the "Drillite" flows into it and creates a hard surface tough enough to withstand considerable impact.

The division of application for this product is interesting. The deposit that the arc leaves from "Drillite" is hard to the point of offering great abrasive resistance. The toughness of this deposit is great, but not as great as that left by the torch. Also, the company finds, the torque resistance of arc welded "Drillite" is sufficient to withstand any normal usage to which it might be applied. When the acetylene flame is used on "Drillite" a slightly softer deposit is left, and this is generally recommended where tremendous impact surfacings are desired.

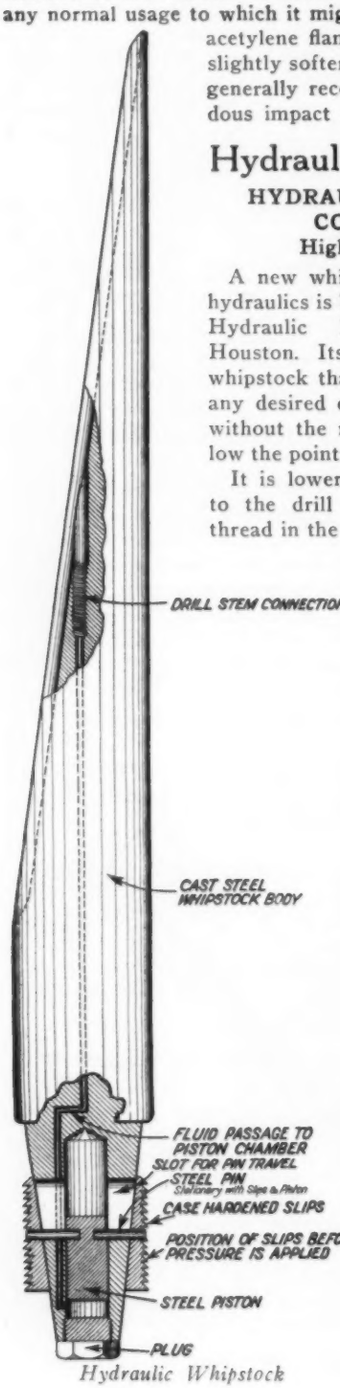
Hydraulic Set Whipstock

HYDRAULIC EQUIPMENT CORPORATION

High Pressure Tests

A new whipstock set by the use of hydraulics is being manufactured by the Hydraulic Equipment Corporation, Houston. Its purpose is to provide a whipstock that can be set in a well at any desired depth on a drill stem and without the necessity of filling up below the point of sidetracking.

It is lowered into the hole attached to the drill stem (with a left hand thread in the body of the whipstock) to the point where it is desired to mill out the casing. Pressure is then applied by a splash pump, which causes the slips attached to lower the body of the whipstock to move upward against the sides of the casing and set whipstock. The design is such that any pressure exerted from above after the slips are set causes the whipstock to set tighter.



Hydraulic Whipstock

The drill stem is then withdrawn by rotating to the right until the stem unscrews from the body of the whipstock. The teeth in the slips are machined both horizontal and vertical to prevent slipping or turning.

The accompanying illustration, which gives an interior view of the hydraulic set whipstock is practically self-explanatory. Any further details, however, are available by writing the manufacturers at Houston.

New Disc Grinder

VAN DORN ELECTRIC TOOL COMPANY

Van Dorn Electric Tool Company of Cleveland has just announced a new seven-inch flex-disc grinder in addition to the present nine-inch grinder, an improvement over the hand method of smoothing welded and soldered joints and seams, cleaning dies, smoothing metal surfaces before painting and any other work requiring filing, sanding and emerying.

With the use of a felt backed abrasive disc it is designed to handle these operations quickly and satisfactorily.

The improvements made on the seven-inch grinder have been included on the nine-inch grinder such as refined design, a removable pipe handle and right and left hand bosses, making it possible to quickly and easily change the grinders for right or left hand operation.

To complete the line of portable grinders, the Van Dorn Electric Tool Company has a new seven-inch bench grinder for sharpening edge tools and light grinding.

It is a compact ball bearing grinder with the bearings mounted in dustproof housings. Its dynamic balance offers smoother running and a decrease in vibration.

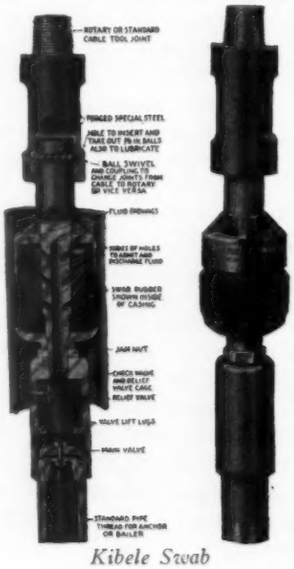
It is furnished complete with grinding wheels, adjustable tool rests, wheel guards, switch and cable, and is available for all voltages and currents.

New Swab

KIBELE MANUFACTURING COMPANY

The Kible production swab has recently been placed on the market by Kibele Manufacturing Company of San Antonio, Texas, with the Lucey Products Corporation, Tulsa, as Mid-Continent distributors.

This swab, with a number of new features, is designed for especially heavy loads from 20 up to 500 feet of fluid. It is constructed so that the fluid pressure works with instead of against it.


ROTARY OR STANDARD CABLE TOOL JOINT
FORGED SPECIAL STEEL
ABLE TO INSERT AND TAKE OUT Pb OR BALLS ALSO TO LUBRICATE
BALL SWIVEL AND COUPLING TO CHANGE JOINTS FROM CABLE TO ROTARY OR VICE VERSA
FLUID (DRAWN)
RIBBED OF HOLES TO ADMIT AND DISCHARGE FLUID
SWAB RUBBER SHOWN INSIDE OF CASING
JAM NUT
CHECK VALVE AND RELIEF VALVE CAGE
RELIEF VALVE
VALVE LIFT LUGS
MAIN VALVE
STANDARD PIPE THREAD FOR ANCHOR OR BAILER
Kibele Swab

An added protection, lengthening the life of the swab, is made possible through a perfected safety valve, illustrated here, that automatically unloads a weight of about a 535-foot head of fluid. This relief valve is used to insure against plugging a well, if sent to the bottom.

A swivel joint is provided so that the work is efficient in a crooked hole.

Further information on the Kibele swab is available by writing the distributors.

B & B Line "spools pretty" on the cable tool rig of Magnolia Petroleum Company's Homsley No. 3, Earlsboro, Okla. Left: Jack Lee, Tool Dresser; Right: R. S. Stanley, Driller.

"Just Naturally A Good Line"

Listen to R. S. Stanley, Driller, calling down Jack Lee, Tool Dresser, for saying they have good luck with their *B & B Cable Tool Drilling Lines:* "Good luck, your eye! It's just naturally a good *line.*"

Naturally it is. The wire is specially drawn and put through four very strict tests. It is laid up on machinery designed to impart to the rope that *springy* quality which makes drillers call it "the easiest handling line made—a mighty pretty spooling line that you can count on to drill ahead of the tools."

Distributors in all fields handle B & B Patentsteel, Extra Strong Cast Steel and Cast Steel *Cable Tool* Drilling Lines, Sand and Pumping Lines, and invincible Yellow Strand Rotary Lines.

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A good room with bath is obtainable as low as $2.00 per day. Correspondingly reasonable rates on more elaborate accommodation.

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"Largest in Dixie" — 1000 Rooms

HOUSTON, TEXAS

OIL

Its Conservation and Waste

By
JAMES H. WESTCOTT

This is a new book on petroleum written especially for the layman. The style of the book is such that it will appeal to the man not familiar with petroleum or the methods of recovering it. It gives a birds-eye view of the industry in its three phases.

Much data in the form of figures supplements the subject matter. These figures cover production, refining, etc., and constitute a good source for general information. There are 62 tables covering a wide range of topics related to the industry.

213 pages—$3.00 Postpaid.

The GULF PUBLISHING COMPANY
P. O. Box 1307 Houston, Texas

Wrench Sets

STEVENS WALDEN-WORCESTER, INC.

Stevens Walden-Worcester, Inc., of Worcester, Massachusetts, is now manufacturing and marketing to the oil industry a line of special shop tools, entering this field after many years of specializing in shop tools for the automotive industry.

The Walden heavy-duty wrench set No. 510, illustrated here, represents a complete assortment of handles and sockets for turning large, awkwardly placed nuts and bolts. Contents of this set are 10 heavy-duty sockets ranging from one- to two-inch, inclusive, a heavy-duty ratchet wrench, a plug connector, a heavy-duty extension bar, a cross bar handle and an offset adapter. This set is housed in a steel box 20½ x 5½ x 3½ inches.

Set No. 500 is a compact set of heavy-duty wrenches containing a tee and offset handle with six sockets of nut sizes frequently encountered on heavy industrial equipment. The six sockets range in sizes from 1¼- to 1¾-inch.

No. 2285, a ratchet handle, is a hy-duty dropped forged ratchet, five-eighths of an inch square opening, length 15 inches. It is made of chrome alloy steel.

No. OR916 is a ratchet handle with a one-half-inch opening and a 1⅝-inch diameter head. The length is 10¼ inches. This is a single action ratchet used with a detachable plug to fit any socket system. The plug, as in No. 2285 ratchet, is removable when worn, and another plug replaced.

Detailed information on this line of tools may be had by writing the company, requesting Catalog No. 116, which was recently issued.

Offices and warehouses of Dresser & Gorton, Inc., at Tulsa, have been consolidated at 203 South Detroit Street with its store at Second and Detroit Streets. These include the offices of the company's subsidiary concerns, Oil States Manufacturing Company, makers of Durabilt sectional houses, and Machine Tool & Supply Company. District sales offices of the Anchor Post Fence Company and Stefco Steel Company also are maintained at 203 South Detroit.

R. B. McCaine has recently joined the mechanical rubber goods department of B. F. Goodrich Rubber Company, Dallas, Texas, as field salesman.

"ROCK BIT STEEL"

Sullivan Machinery Company, 400 North Michigan Avenue, Chicago, is distributing a new handbook of "Rock Bit Steel," which deals with the selection, heating, forging and tempering of steel, and including instructions for the care and use of Sullivan drill sharpeners and drill steel furnaces.

This handbook is No. 72-K and is written to give practical working hints as to the proper handling of the drill steel problem. The book contains instructions for operation of two different types of Sullivan drill steel sharpeners and also of the Sullivan drill steel furnaces, operated either by oil or gas.

There is a separate chapter on pyrometers and pyrometer control, and on the magnetic indicator for indicating the critical point in heating steel for forging or tempering. There is a separate chapter on heat treating of drill steel, and also an illustration of a drill sharpening shop, showing the proper layout of the equipment. The "Drill Steel Dont's" section of this booklet offers a feature of outstanding importance.

The handbook is 48 pages, 8½ x 11 inches in size, fully illustrated with many cuts and diagrams of detailed operations.

A copy is available upon request.

HAYNES STELLITE

Haynes Stellite Company, Kokomo, Indiana, has published and is distributing a 30-page booklet, "Properties of Haynes Stellite." This booklet has been completely revised, brought up to date and includes additional information which did not appear in previous editions. It covers a general description of the Haynes Stellite alloys, an explanation of red hardness, the uses, physical properties, chemical properties and structure of these alloys. The booklet is completely illustrated.

A copy of this booklet is available by writing to the company's home office, shown above.

The hazards of mining incident to oil and gas wells penetrating the coal measures in proximity to mine workings have been covered in two bulletins issued by the United States Bureau of Mines. They are: Technical Paper 53 and Bulletin 65. Further information concerning activities of the bureau and co-operating agencies along these lines may be had by writing the bureau at Washington for Pamphlet I. C. 6195, issued in November, 1929.

New Aviation Engine

MacCLATCHIE MANUFACTURING COMPANY

The radial engine of L-head design which is being manufactured by the MacClatchie Manufacturing Company, Compton, California, has just been officially approved by the Department of Commerce at Washington, following testing and inspection.

The power plant is the MacClatchie "Panther," rated at 150 horsepower at 1850 r.p.m., and is a seven-cylinder, four-cycle, air-cooled unit. The design eliminates the rocker arms, long pushrods and allied parts, and approximately 200 parts in all have been eliminated. This turbulent combustion L-head chamber brings into aviation engines the radial type engine common in automotive power plants.

A $200,000 manufacturing plant is ready for production at Compton, and this aviation engine will be carried on entirely separately from the specialty products of the company.

The engine has a 4½-inch bore and a 5½-inch stroke, with a total piston displacement of 612-15 cubic inches. Compression volume is a ratio of five to one. The estimated fuel consumption is .56 per horsepower hour, and estimated oil consumption is .023 per horsepower hour.

The "Panther" has a dual ignition, scintilla magnetos and a Stromberg carburetor. It has a pressure lubricating system.

Full particulars are available upon request to the manufacturers.

TYLER BOILER TUBES

O. H. Steel Boiler Tubes
Armco Ingot Iron Boiler Tubes
Cop-R-Loy Boiler Tubes

Request full details

THE TYLER TUBE & PIPE CO.
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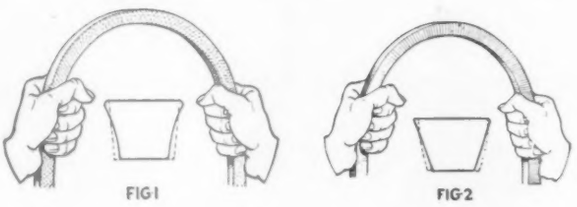


You can quickly prove the definite advantages you get from the concave molded sides of Gates Vulco Rope.

Just take this belt in your hands and bend it as it would bend in going around a pulley. You will notice that the concave sides *straighten out*—exactly as illustrated by the dotted lines in figure 1.

Now, do this same thing with the ordinary, straight-sided belt. As this belt bends, the straight sides are forced to bulge outward and the belt assumes, in the sheave groove, the shape indicated by the dotted lines in figure 2. This bulging against the sheave groove walls naturally produces uneven wear along the sides of the belt. And because the full side of the belt is not evenly gripping the pulley, there is a definite loss in transmission efficiency.

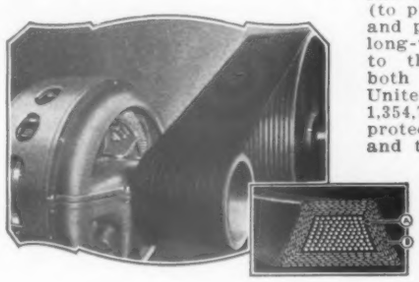
That is why the concave molded side (patent pending) of Gates Vulco Rope is important to you. It means a perfect fit in the sheave groove—and this means evenly distributed wear—naturally, longer life. It means a full side-width grip on the pulley—and this means full delivery of power.

Our engineering department is prepared to render you a truly helpful service in drive designing without the slightest obligation.

Send for this valuable helpful book—today!

Patented Construction

The construction of Gates Vulco Rope is patented. The core of strong endless cords (to give the belt strength) and the bias cut cover (to protect the cords and present a tough, long-wearing surface to the pulley) are both Gates patents. United States patents 1,354,738 and 1,400,539 protect the principle and the construction of a V-belt having a center of endless cords with a bias cut cover.



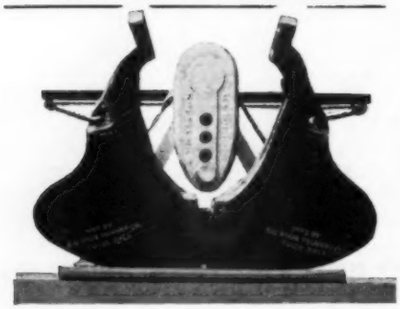
GATES VULCO ROPE

MULTIPLE V-BELT DRIVES

Manufactured by Gates Rubber Company, Denver, Colo.

The World's Largest Manufacturers of V-Belts

Big 4
Counter Balance



Applied directly to any make of crank that you are already using on your rig—

No Special Equipment Required

The Big Four Counter-Balance is divided into two parts and the amount of counter-balance load can be varied as well as the relative loading area with regard to the movement of the crank.

The greatest advantage of the Big Four Counter-Balance over any other make is that it can be applied directly on any make of crank that you are already using on your rig, all we need is the make and pattern number of your crank.

Two bolts clamp the Balance to the crank, thus requiring no special equipment. Installed on the outside, the balance is in plain view and easy to get at. It is so constructed that plates may be added or taken off to suit the depth of the well. The bell shape is designed to balance the well perfectly at every point in the revolution of the crank pin, relieving the belt of strain and whip and giving a continuous motion to the rods.

If desired these Balances can be placed in lead or lag with regard to the crank motion and the amount of weight actually used is variable.

This Counter-Balance has been adopted as standard equipment by the engineers of such companies as: Shell, Carter, Amerada, Empire, Sinclair, Slick, I. T. I. O., Tidal, etc., and has been proven by different Superintendents that this balcan be removed for pulling rods, etc., by one man in three minutes and replaced in four minutes.

Manufactured by

Big Four Foundry Co., Inc.

TULSA, OKLAHOMA

Office: Thompson Building, 5th and Boston
Foundry 301 N. Hartford Phone 4-3851

COUNTER-BALANCE INSTALLED

Squeaks from the Bull Wheel

Flapper—And next week I'm off to Paris to get my clothes.

Grandmother — Yes, yes; I'd wondered where you'd left them.

That Jones boy that used to work for you wants me to give him a job. Is he steady?

Well, if he was any steadier he'd be motionless.

Algernon (reading joke)—Fancy this, Percy: A chap here thinks that a football coach has four wheels.

Percy—Haw, haw! And how many wheels has the bally thing?

Patron: Here's a piece of rubber tire in my hash!

Waiter: No doubt. The motor is displacing the horse everywhere.

Sweet Young Thing—"That new man called the house four times before I gave him a date."

Boy Friend—"Who did he ask for the first three times?"

Sam: Why is it that statistics show women live longer than men?

Abe: Well, you know paint is a great preservative.

Tammas: Mon, these lower taxi fares will make a serious deeference tae us. We'll not be able to save sae much by walkin'.—Montreal Star.

Fred: How long will it take you to fix that car?

Mechanic: I'm afraid it will take a long time, sir. That's the only job we have at present.

Sandy: How much to the station?

Cabman: Two shillings, sir.

Sandy: Does that include the charge for my bags?

Cabman: I'll take those for nothing.

Sandy: Excellent. Then I'll walk.

"How is your son getting on at college?"

"He must be doing pretty well in languages. I have just paid for three courses—$10 for Latin, $10 for Greek and $100 for Scotch."—Skelly Service.

"And you say you guarantee these canaries?"

"Guarantee them? Why, madam, I raised them from canary seed!"

It was at a negro revival service and the minister had just made a fervent appeal to his fervid audience to stand up and testify, when a buxom young damsel rose and cried: "Last night I was in the ahms of the debil, but tonight I is in the ahms of the Lord!"

And a male voice from the rear asked: "Is you gwine to be busy tomorrow night, sistah?"

To what do you owe your extraordinary success as a house-to-house salesman?

To the first five words I utter when a woman opens the door—'Miss, is your mother in?'

Daughter—Mamma, I advertised under an assumed name that I should like to make the acquaintance of a nice gentleman.

Mamma—How shocking! And what was the result?

Daughter—I only got one answer, and that was from papa.

Herbert—Arthur hasn't been out one night for three weeks.

Flora—Has he turned over a new leaf?

Herbert—No; he's turned over a new car.

"On what grounds are you seeking a divorce from your wife?"

"Misrepresentation. When I asked her to marry me she said she was agreeable."

Two tramps walking along the railroad found a bottle of high powered moonshine. One took a drink and passed it to the other. And so forth, until the bottle was empty.

After awhile, one puffed out his chest and said: "You know, Bill, tomorrow I'm going to buy this road. I'm going to buy all the railroads in the country, all the automobiles, all the steamboats, all the hotels—everything. What do you think of that?"

Bill looked at his companion disparagingly and replied: "Impossible; can't do it."

"Why not?"

"I won't sell."

A piano manufacturer tried to get a testimonial from Will Rogers for his pianos. Rogers, who never endorses any product unless he really believes in it, wrote this letter to the piano firm: "Dear Sirs:

"I guess your pianos are the best I ever leaned against. Yours truly,

"Will Rogers."

The self-made man was in the midst of his first interview. "How," inquired the reporter, "did you find time to read in those formative years?"

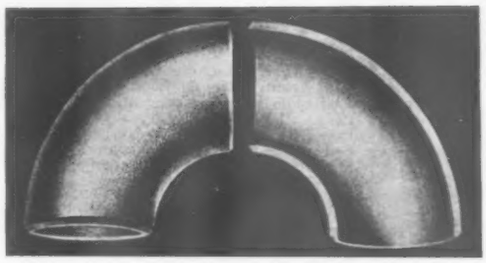
The self-made man patted his chest proudly.

"I kept a good book open on my desk," said he, "and read it during telephone calls—while holding the wire after some one had said 'Just a moment, please.'"

Judge—What made you suppose the accused was intoxicated?

Policeman—He was wearing a watch with an illuminated dial, and trying to light his cigar with it.

Tube Turns



The

STOCK FITTING FOR WELDED PIPING

with

True circular cross section and uniform wall thickness when welded into the line reduce friction, cut out leaks and save installation time.

In Stock by

MAINTENANCE ENGINEERING CORPORATION

P. O. Box 1402 Phone: Pres. 2274 - LD 409

HOUSTON, TEXAS

THE SMALL TORSION-BALANCE

EASILY PORTABLE BY ONE MAN

An instrument for all types of geological prospecting work.

Weight: 15.5 kg. net=34.2 lbs. net

Unsurpassed in Accuracy and Sensitiveness, Unequalled in operating when changing stations.

Prospects sent post free on application.

GEBRUDER HAFF, G. m. b. H.

Pfronten-Ried, Germany

Manufacturers of mathematical instruments—Founded 1835

THE ANSWER
to the drillers' demands!

It is said an "Ideal" is never obtained—that it is something mythical—too perfect to be within reach of mankind.

Yet the drillers' ideal may be reached with a bit made from ASCO Well Bit Tool Steel—steel which causes the driller to cast aside worry about rock formations. ASCO Well Bit Tool Steel is made to stand the gaff under the most severe strains, thereby giving the assurance of continuous drilling without fear of tool or labor loss.

When the going gets tough, try a bit made from ASCO Well Bit Tool Steel—watch the results—note the difference.

THE ANDREWS STEEL CO.
NEWPORT ASCO KENTUCKY

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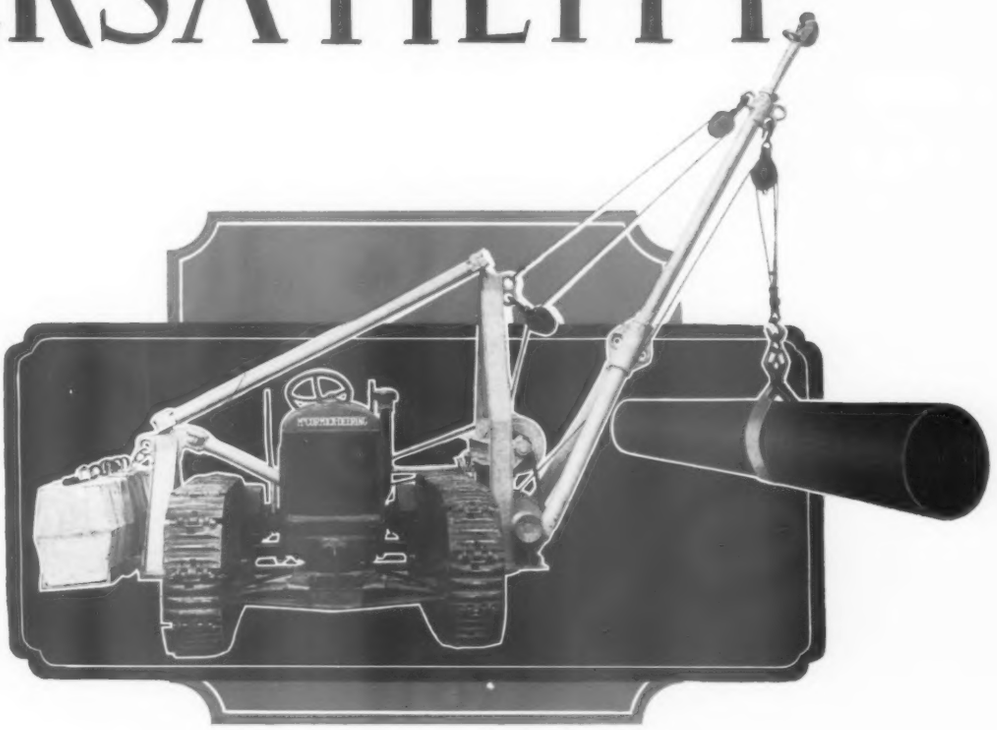

◀*of the* W-K-M Side Boom Unit ▶

A combined handling and backfilling unit!—Attachable to 10-20 McCormick-Deering Tractors, equipped with Model DH Trackson Tracks.

As a pipe handling unit it has the capacity to meet all the demands of the pipe-line industry. As a backfiller, it has *no peer.*

The Unit is equipped with a telescopic boom which can be extended to various lengths. It is hinged at the base, permitting raising and lowering without difficulty.

Ball and socket joints are provided to absorb track distortions.

Installation requires *no* drilling or cutting. The Unit can be applied *in the field* by two men in approximately three to four hours.

And, *Remember*—use of the drawbar is in no way hindered!

W-K-M Company, Inc.

INDUSTRIAL, PIPE LINE & OIL FIELD EQUIPMENT

Cable Address "WILKOMAC"

HOUSTON ▲ TEXAS

Export Office

74 TRINITY PLACE, NEW YORK CITY

This "BJ" 3" Wilson ROTARY ELEVATOR

held 6,975 ft. of 3" drill pipe *in a 15-foot drop!**

Unretouched photograph of elevator after the fall shows but slight damage which was repaired and the elevator put back into service.

AN impact equivalent to 754 foot tons occurred when the wire line broke and the elevator hit the table with 6,975 feet of 3-inch drill pipe . . . yet this elevator held the string, saving the pipe, preventing a bad fishing job, and possibly saving the hole . . . Life and property are safer with BJ Wilson Elevators.

*The accident referred to occurred on the Sunset-Pacific Oil Company's Marine No. 31 at Athens, California.

Oil Tool Division of

BYRON JACKSON CO.

Established 1872

2150 East Slauson Avenue Los Angeles

Tulsa, Oklahoma City, Houston, Fort Worth, New York City